

Gelman Sciences Inc.
642 South Wagner Road
Ann Arbor, MI 48103
734.436.4025 phone
734.436.4040 fax

CASE NARRATIVE

**Monthly Data Gelman Sciences
Project: 1,4-Dioxane Remediation
Date: April 2022**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition, all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Gelman Sciences Inc. attests to the validity of the laboratory data generated by Gelman Sciences Ann Arbor, Michigan Environmental Laboratory facilities reported herein. All analyses performed by Gelman Science's Environmental Laboratory facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Gelman Science's Environmental group has reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

At the end of the month some of the 1,4-dioxane samples were sent to Ann Arbor Technical Services for analysis due to a reproducibility problem. The balance of the samples was analyzed for 1,4-dioxane at Gelman Science's Environmental Laboratory. All bromate samples were analyzed by Gelman Science's Environmental Laboratory. The test results in this report meet all NELAP requirements for parameters for which accreditation are required or available. Any exceptions to NELAP requirements are noted in this report. All exceptions are noted per laboratory standard operating procedure based on EPA Method 1624c. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results. The odd even rule is used for rounding. Holding times were met for all samples analyzed. Proper preservation was observed on all samples unless otherwise detailed in the individual sections below. Samples MW-54d, 72d, and 71 were recollected due to questionable results.

RECEIPT/ STORAGE

The samples were received on the days noted in the report for the Month; the samples arrived in good condition, properly preserved and on ice when necessary. Samples that require 1,4-dioxane analysis are collected in hydrochloric HCl acid-preserved vials to a pH of ≤2, except for the Pall ozone treatment samples. These samples have chemicals that, when mixed with the HCl acid, cause interferences and trap damage. Every attempt is made to analyze these samples within 24 hours of receipt.

Samples that require Bromate analysis are collected and preserved in the laboratory with ethylene di-amine and refrigerated.

Samples that are delivered to the laboratory the same day as they are collected are likely not to have reached a fully chilled temperature. This is acceptable as long as there is evidence that chilling has begun. All samples are iced or refrigerated at 4°C ($\pm 2^\circ\text{C}$) from the time of collection until sample preparation or analysis.

1,4-Dioxane (GC-MS)

All ground water and treated water samples were analyzed for 1,4-Dioxane (GC-MS) in accordance with EPA 1624C, which has been modified to enhance detection limits. Samples that were diluted to bring them within the calibrated range of the instrument are noted with a "D" under the Qualifier Code section of the data report. Reporting limits were adjusted based on each dilution.



Reporting limit for undiluted samples is 1ppb (part per billion, micrograms per liter, µg/L). All quality control parameters were within the acceptance limits for reported samples unless indicated.

Bromate (Ion Chromatography)

All surface water and treated samples were analyzed for Bromate (Ion Chromatography) in accordance with EPA 300.1. Surrogates are added to all samples. All quality control parameters were within the acceptance limits with the balance of sample analyzed.

The reporting limit for treated samples is 5.0ppb and for surface samples is 2.0ppb.

Barium

A composite Outfall001 sample was sent to Ann Arbor Technical Services (ATS) for total barium analysis in accordance with EPA 200.7. Barium samples are analyzed quarterly in compliance with PLS NPDES permit. This sample is preserved with nitric acid and refrigeration. The results were less than the permitted level of 440µg/L at 160µg/L.

Qualifiers

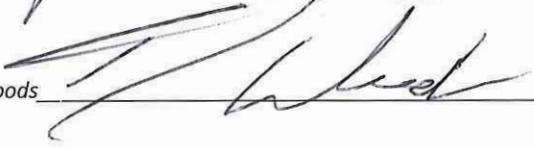
1,4-Dioxane Qualifier Codes:

<i>Qualifier Code</i>	<i>Description</i>
nd:	The compound was analyzed for, but not detected at or above the detection limit indicated.
D:	Analyte value quantified from a dilution; reporting limit is raised to reflect dilution.
E:	The compound result is greater than the upper quantitation limit in the associated calibration curve, reported as estimate.
B:	The sample vials contained air bubbles larger than 5mm, which may affect compound results.
J:	The compound was positively identified; the associated numerical value is the approximate concentration.
M:	Matrix effects, sample required dilution.
R:	The reported value is unusable and rejected due to variance from quality control criteria.
V:	The reported value is considered estimated due to variance from quality control criteria.
H:	Sample was analyzed past 14-day hold time, but within 45 days.
O:	Samples analyzed in outside laboratory.
S:	Samples split with DEQ.

Bromate Qualifier Codes:

<i>Qualifier Code</i>	<i>Description</i>
nd:	The compound was analyzed but was not detected at or above the detection limit indicated.
E:	The compound result is greater than the upper quantitation limit in the associated calibration curve.
J:	The compound was positively identified; the associated numerical value is the approximate concentration.
R:	The reported value is unusable and rejected due to variance from quality control criteria.
V:	The reported value is considered estimated due to variance from quality control criteria.
H:	Sample was analyzed past 28-day hold time

Analyst: Gage M. Trendel  Date: 5/10/22

Report Checked by: Ray Woods  Date: 5/10/22



Gelman Sciences

642 South Wagner Road
Ann Arbor, MI 48103-9019 USA
734.436.4025 phone

Sample Analysis Report

April, 2022

Analyst Initials: CKT
Date: 5/10/22

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
C3								
MW-1 Replacement-04-21-22-14:20-1	1600	80						O,D
MW-105s-04-19-22-10:59-1	370	10						O,D
MW-32-04-28-22-14:52-1	14	1.0						O
D0								
MW-142s-04-25-22-10:49-1	nd	1.0						O
MW-143s-04-25-22-12:22-1	nd	1.0						O
MW-53d-04-04-22-09:02-1	nd	1.0						O
MW-53i-04-04-22-11:38-1	36	1.0						O
MW-53s-04-04-22-10:22-1	nd	1.0						O
D2								
175 Jackson Plaza-04-04-22-13:50-1	1200	40						O,D
2819 Dexter Rd-04-19-22-12:34-1	160	10						O,D
MW-107-04-19-22-14:10-1	580	10						O,D
MW-113-04-26-22-13:19-1	180	4						O,D
MW-120s-04-18-22-14:15-1	nd	1.0						O
MW-121s-04-18-22-09:36-1	nd	1.0						O
MW-92-04-26-22-11:55-1	87	4						O,D
MW-BE-1d-04-22-22-12:23-1	500	10						O,D
MW-BE-1s-04-22-22-13:50-1	570	40						O,D
E								
MW-101-04-07-22-14:36-1	90	10						O,D
MW-103d-04-11-22-12:55-1	6	1.0						O
MW-103s-04-01-22-12:35-1	83	1.0						O
MW-104-04-07-22-12:06-1	30	1.0						O
MW-105d-04-19-22-09:49-1	130	10						O,D

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
MW-106s-04-26-22-14:55-1	280	20						O,D
MW-108d-04-21-22-11:17-1	510	10						O,D
MW-108s-04-21-22-10:01-1	220	10						O,D
MW-110-04-07-22-13:22-1	120	10						O,D
MW-112d-04-11-22-10:26-1	2	1.0						O
MW-112i-04-11-22-11:35-1	9	1.0						O
MW-112s-04-11-22-09:16-1	3	1.0						O
MW-119-04-26-22-09:04-1	37	1.0						O
MW-120d-04-18-22-12:56-1	nd	1.0						O
MW-121d-04-18-22-10:45-1	2	1.0						O
MW-142d-04-25-22-09:38-1	nd	1.0						O
MW-143d-04-24-22-15:16-1	nd	1.0						O
MW-143i-04-25-22-13:31-1	nd	1.0						O
MW-71-04-21-22-12:43-1	1100	20						O,D
MW-76i-04-12-22-10:55-1	110	5						O,D
MW-76s-04-12-22-12:05-1	310	5						O,D
MW-79d-04-07-22-09:26-1	nd	1.0						O
MW-79s-04-07-22-10:38-1	290	10						O,D
MW-81-04-26-22-10:31-1	150	4						O,D
MW-84s-04-12-22-09:14-1	320	10						O,D
MW-85-04-12-22-13:28-1	420	40						O,D

Surface Water

Not Applicable

HC/HR-04-01-22-12:45-1			nd	2.0				
HC/HR-04-04-22-09:50-1			nd	2.0				
HC/HR-04-05-22-11:00-1			nd	2.0				
HC/HR-04-06-22-09:50-1			nd	2.0				

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
HC/HR-04-07-22-10:20-1			nd	2.0				
HC/HR-04-08-22-10:40-1			nd	2.0				
HC/HR-04-11-22-10:40-1			nd	2.0				
HC/HR-04-12-22-09:20-1			nd	2.0				
HC/HR-04-13-22-09:45-1			nd	2.0				
HC/HR-04-14-22-10:00-1			nd	2.0				
HC/HR-04-15-22-09:50-1			nd	2.0				
HC/HR-04-18-22-09:30-1			nd	2.0				
HC/HR-04-19-22-11:00-1			nd	2.0				
HC/HR-04-20-22-11:30-1			nd	2.0				
HC/HR-04-21-22-09:40-1			nd	2.0				
HC/HR-04-22-22-09:05-1			nd	2.0				
HC/HR-04-25-22-13:30-1			nd	2.0				
HC/HR-04-26-22-09:00-1			nd	2.0				
HC/HR-04-27-22-09:10-1			nd	2.0				
HC/HR-04-28-22-13:15-1			nd	2.0				
HC/HR-04-29-22-12:00-1			nd	2.0				

Treatment System

OUTFALL-04-03-22-1	6	1.0						O
OUTFALL-04-03-22-2			6.2	5.0				
OUTFALL-04-04-22-1	6	1.0						O
OUTFALL-04-04-22-2			8.0	5.0				
OUTFALL-04-05-22-1	5	1.0						O
OUTFALL-04-05-22-2			7.2	5.0				
OUTFALL-04-06-22-1	5	1.0						O
OUTFALL-04-06-22-2			8.8	5.0				
OUTFALL-04-07-22-1	5	1.0						O

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
OUTFALL-04-07-22-2			7.4	5.0				
OUTFALL-04-10-22-1	8	1.0						O
OUTFALL-04-10-22-2			11	5.0				
OUTFALL-04-11-22-1	8	1.0						O
OUTFALL-04-11-22-2			8.4	5.0				
OUTFALL-04-12-22-1	7	1.0						O
OUTFALL-04-12-22-2			8.0	5.0				
OUTFALL-04-13-22-1	7	1.0						O
OUTFALL-04-13-22-2			7.2	5.0				
OUTFALL-04-14-22-1	8	1.0						O
OUTFALL-04-14-22-2			8.3	5.0				
OUTFALL-04-17-22-1	6	1.0						O
OUTFALL-04-17-22-2			8.2	5.0				
OUTFALL-04-18-22-1	6	1.0						O
OUTFALL-04-18-22-2			11	5.0				
OUTFALL-04-19-22-1	5	1.0						O
OUTFALL-04-19-22-2			11	5.0				
OUTFALL-04-20-22-1	6	1.0						O
OUTFALL-04-20-22-2			12	5.0				
OUTFALL-04-21-22-1	5	1.0						O
OUTFALL-04-21-22-2			10	5.0				
OUTFALL-04-24-22-1	6	1.0						O
OUTFALL-04-24-22-2			8.8	5.0				
OUTFALL-04-25-22-1	5	1.0						O
OUTFALL-04-25-22-2			10	5.0				
OUTFALL-04-26-22-1	6	1.0						O
OUTFALL-04-26-22-2			11	5.0				

Sample Name - Date/Time Sampled	1,4-Dioxane Results (ppb)	R.L. (ppb)	Bromate Results (ppb)	R.L. (ppb)	Bromide Results (ppb)	R.L. (ppb)	Comments	Qualifier(s)
OUTFALL-04-27-22-1	5	1.0						O
OUTFALL-04-27-22-2			13	5.0				
OUTFALL-04-28-22-1	7	1.0						O
OUTFALL-04-28-22-2			13	5.0				
Red Pond-04-01-22-09:00-1	400	10						O,D
Red Pond-04-04-22-06:40-1	360	40						O,D
Red Pond-04-05-22-07:35-1	360	10						O,D
Red Pond-04-06-22-07:55-1	420	40						O,D
Red Pond-04-07-22-07:00-1	580	40						O,D
Red Pond-04-08-22-07:20-1	530	40						O,D
Red Pond-04-11-22-07:20-1	590	40						O,D
Red Pond-04-12-22-07:05-1	530	40						O,D
Red Pond-04-13-22-07:15-1	470	10						O,D
Red Pond-04-14-22-07:35-1	520	40						O,D
Red Pond-04-15-22-07:33-1	520	40						O,D
Red Pond-04-18-22-07:10-1	480	40						O,D
Red Pond-04-19-22-09:05-1	510	40						O,D
Red Pond-04-20-22-07:10-1	490	40						O,D
Red Pond-04-21-22-07:20-1	360	40						O,D
Red Pond-04-22-22-07:10-1	560	40						O,D
Red Pond-04-26-22-07:20-1	450	40						O,D
Red Pond-04-27-22-07:15-1	550	10						O,D
Red Pond-04-28-22-07:25-1	510	40						O,D
Red Pond-04-29-22-07:35-1	420	40						O,D



290 South Wagner Road
Ann Arbor, Michigan 48103
Tel. 734/995-0995 Fax. 734/995-3731
Michigan Laboratory ID: 9804
Wisconsin Laboratory ID: 998321720

Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Inorg_SRF_0411221
Client PO Number: 4505179649

Project Description: This data report contains the results of 1 water sample, received by ATS on April 11, 2022 to be analyzed for Barium.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel _____ **Email:** gage_trendel@pall.com _____
FAX Number: _____

No. of Pages (including cover pg.): 10 _____

From: Sarah Stubblefield _____ **Email:** Sarah.Stubblefield@AnnArborTechnicalServices.com _____
Senior Chemist / Lab Manager **FAX Number:** 734-995-3731 _____

Additional Message: Copy report to: Patterson, Keith (keith_patterson@pall.com), Brode, Jim (jim_brode@pall.com)
Katie Strohauer (kstrohauer@fveng.com), rwoods@fv-operations.com, Peters, Sue Peters (sue_peters@pall.com)
Amanda Isabella (amanda_isabella@pall.com)

Date: 4/18/22 _____

Signed: 

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-995-0995.

This material is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering this material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.



**INORGANIC ANALYSIS
Barium by ICP-AES
USEPA 200.7**

ATS Project Number: G001-002.22

ATS SDG: 0411221

Prepared By:

Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103



LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002

Report Date: 4/18/22

SRF / SDG Number(s): 0411221

Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following sample that was received at Ann Arbor Technical Services, Inc. (ATS) on 4/11/22, and associated matrix-specific QA/QC:

Samples

Client Sample Identification	Sample Date	Requested Turn Around Time	Analysis	Matrix
Received 4/11/22				
Outfall Grab	4/9/22	Standard	Barium	Water

Upon receipt, samples were scheduled for the following analyses:

Analysis

- Metals Digestion by US EPA 200.7
- Select Metals by US EPA 200.7 (Barium)

Number of Samples

- 1 Sample + 1 Matrix Spike + 1 Matrix Spike Duplicate
- 1 Sample + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Samples were preserved to a pH of <2 at the time of sample receipt. Sample condition and anomalies, if any, are presented in the "Sample Receipt" section of this report. All samples were prepared and analyzed within the holding times cited in the corresponding analytical methods with the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedures (SOPs) specific to the ATS Laboratory, as required by US EPA. All data are peer and management reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DUP, DUP, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA R5 EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Preparation

Samples were digested in accordance with US EPA method 200.7 (Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry).

Anomalies Noted:

- None

Sample Analysis

Samples were analyzed in accordance with US EPA method 200.7 (Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry). An initial calibration with at least five levels was used to quantitate individual metals. Samples were reported to project specific reporting limits as mg/L.

Anomalies Noted:

- None

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for barium.

- None

Analytical QA/QC Summary

Calibration Verification

Method calibration was verified through the analysis of a mid-level initial calibration verification (CV) standard at a frequency of every ten samples. All verification standards met the acceptance criteria with the following exceptions:

- None

Instrument Blanks

Low system background was demonstrated through the analysis of instrument blanks at a minimum of every ten samples. All instrument blanks met the acceptance criteria with the following exceptions:

- None

QA/QC Batch Summary

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed with the QA/QC batch. The LRB met the acceptance criteria with the following exceptions:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OPR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB) was analyzed as part of the QA/QC batch. The LFB met the acceptance criteria with the following exceptions:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the acceptance criteria with the following exceptions:

- None

PRECISION

Matrix Spike and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The replicates met the acceptance criteria with the following exceptions:

- None



/ April 18, 2022

Mark T. DeLong (Quality Assurance Coordinator)



/ April 18, 2022

Philip B. Simon (Laboratory Director)



290 South Wagner Road
Ann Arbor, Michigan 48103
Tel. 734/995-0995 Fax. 734/995-3731
Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

CHAIN OF CUSTODY RECORD

Page 1

PROJECT ID / NUMBER Pall / G001-002		Client Purchase Authorization (Purchase Order) PO# 4505179649				SHIPPING INFORMATION: SHIPPER (Check one) / TRACKING NUMBER(S) (If applicable)							
		Date	<input type="checkbox"/> Fed Ex	<input type="checkbox"/> UPS	<input type="checkbox"/> DHL	<input type="checkbox"/> Courier	Tracking Number						
		Date	<input type="checkbox"/> Fed Ex	<input type="checkbox"/> UPS	<input type="checkbox"/> DHL	<input type="checkbox"/> Courier	Tracking Number						
		Date	<input type="checkbox"/> Fed Ex	<input type="checkbox"/> UPS	<input type="checkbox"/> DHL	<input type="checkbox"/> Courier	Tracking Number						
		Date	<input type="checkbox"/> Fed Ex	<input type="checkbox"/> UPS	<input type="checkbox"/> DHL	<input type="checkbox"/> Courier	Tracking Number						
RELINQUISHED BY (Print & Signature) 		DATE / TIME 4/11/22 9:30	RECEIVED BY (Print & Signature) 	DATE / TIME 4/11/22		RELINQUISHED BY (Print & Signature)		DATE / TIME	RECEIVED BY (Print & Signature)		DATE / TIME		
RELINQUISHED BY (Print & Signature)		DATE / TIME	RECEIVED BY (Print & Signature)	DATE / TIME		RELINQUISHED BY (Print & Signature)		DATE / TIME	RECEIVED BY (Print & Signature)		DATE / TIME		
COMMENTS (Preservation, etc.) Outfall/Eff->Unpreserved All others->HCl preserved													
LINE NO.	LABORATORY IDENTIFICATION (ATS Use Only)	DATE	TIME	COMP	GRAB	Sample Identification	NO. OF CONTAINERS	PRIORITY NUMBER	ANALYSIS				MATRIX: Indicate Soil/Water/Air/ Sediment/Sludge/ Extract
									EPA 1624 1.4 Dioxane	Bromide	Chloride	Fe2+Fe3		Barium
1.	0411221-1	4/10/2022	n/a	X		Outfall	1	1	X				Water
2.	2	4/11/2022	7:20		X	Red Pond	1	1	X				Water
3.	3	4/11/2022	7:25		X	Eff-OC-1a	1	1	X				Water
4.	4	4/11/2022	7:25		X	Eff-OC-2a	1	1	X				Water
5.	5	4/11/2022	7:30		X	Outfall Grab	1	1	X				Water
6.	6	4/9/2022	n/a	X		305 Berium Outfall Grab * attached email from Gage				X			Water
7.													
8.													
9.													
10.													
11.													
12.													
13.													
14.													
15.													
16.													
17.													
18.													
19.													
20.													

* - Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard



290 South Wagner Road
Ann Arbor, Michigan 48103
Tel. 734/995-0995 Fax. 734/995-3731
Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

Inorganic Analysis Data Summary Sheet

For: Mr. Gage Trendel
Pall Corporation
642 South Wagner Road
Ann Arbor, MI 48103

ATS Project: Pall Corporation #G001-002
Report Date: 4/18/22
ATS SRF: 0411221

Sample Identification: Outfall Grab

Sample Date: 4/9/22
Sample Time: na
Sampled By: Client
Laboratory Receipt Date: 4/11/22
Sample Matrix: Water

Parameter	Method	Units	Result	Reporting Limit	Analysis Date	Analysis Time	Analyzed By
Metals Analysis							
Metals Digestion	EPA 200.7	-	Yes	-	4/13/22	10:20	DMS
Total Barium	EPA 200.7	mg/L	0.16	0.001	4/14/22	12:24	DMS

Comments

All methods reference USEPA methods unless otherwise noted.
na - Indicates not available / not applicable.



290 South Wagner Road
Ann Arbor, Michigan 48103
Tel. 734/995-0995 Fax. 734/995-3731
Michigan Laboratory ID: 9604
Wisconsin Laboratory ID: 998321720

Quality Assurance / Quality Control Data Summary

QC Batch Number: QCINORG0413221
Parameter: Barium (US EPA 200.7)

ATS Project: Pall Corporation #G001-002
Report Date: 4/18/22

Results of QA Samples run concurrently with project samples

REPLICATE ANALYSIS

Sample	Replicate #1	Replicate #2	Mean	Relative Range (percent)
#G001-002 Outfall Grab Matrix Spike	1.8 mg/L	1.8 mg/L	1.8 mg/L	4.3

SPIKES and/or QC CHECK SAMPLES

Sample/Analyte	Known Concentration	Spike Concentration	Analyzed Concentration	Recovery (percent)
#G001-002 Laboratory Fortified Blank	<0.001 mg/L	1.6 mg/L	1.7 mg/L	104.1
Outfall Grab Matrix Spike	0.16 mg/L	1.6 mg/L	1.8 mg/L	104.2
Outfall Grab Matrix Spike Duplicate	0.16 mg/L	1.6 mg/L	1.8 mg/L	99.4

BLANK ANALYSIS

Sample	Analyzed Concentration	QC Decision
#G001-002 Laboratory Reagent Blank	<0.001 mg/L	Acceptable

Comments:

Calculations performed prior to rounding.

Control Limits:

Recoveries

Laboratory Fortified Blank (85 - 115 %)

Matrix Spike (75 - 125 %)

Relative Range

Replicates (<20%)



Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Inorg_SRF_0404221
Client PO Number: 4505179649
Project Description: This data report contains the results of 6 water samples, received by ATS on April 4, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analysis on this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, LQD's, and QA/QC information are available for inspection and audit at the laboratory upon request. All data specifically noted on this report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trentel Email: gage_trentel@pall.com
FAX Number:

No. of Pages (including cover pg.): 18
From: Sarah Stubbfield Email: sarah_stubbfield@AnnArborTechnicalServices.com
Sear Chemist / Lab Manager FAX Number: 734-995-3751

Additional Messages: Copy report to: Patterson, Keith (kelli_patterson@pall.com), Brode, Jim (jim_brode@pall.com)
Kelli Strohauer (kelli_strohauer@tvv-operations.com), Peters, Sue Peters (sue_peters@pall.com)
Amanda Isabella (amanda_isabella@pall.com)

Date: 4/11/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-995-0995.

This material is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering this material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

X:\2001-002\20Data\Transmittal_Cover_Pages\14D.xls

ORGANIC ANALYSIS

1,4-Dioxane by GC/MS
USEPA 1624



LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002
Report Date: 4/11/22
SRF / SDG Number(s): 0404221
Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 6 samples that was received at Ann Arbor Technical Services, Inc. (ATS) on 4/4/22, and executed matrix-specific QA/QC:

Sample	Client Sample Identification	Sample Date	Reagent Time Amt/Unit	Time	Analysis	Matrix
Overall (H1)		4/7/22		14:00:00	Water	
Red Pond		4/7/22		14:00:00	Water	
WIFC-OC-1x		4/7/22		14:00:00	Water	
WIFC-OC-2x		4/7/22		14:00:00	Water	
14D		4/7/22		14:00:00	Water	
14D-10%		4/7/22		14:00:00	Water	

Upon receipt samples were scheduled for the following analyses:

- | | |
|---|---|
| Analyses: | Number of Samples: |
| • 1,4-Dioxane (USEPA 1624) - Urgent TAT | • 2 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate |
| • 1,4-Dioxane (USEPA 1624) - Standard TAT | • 1 Sample |

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either presented in the "Sample Receipt" section above or report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

* None

0001-00222CH_0404221.xls
Consultant in Chemistry & Environmental Science
200 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734-995-0995 Fax 734-995-3731

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP). All data are subject to review and approval by the laboratory manager. All data are reviewed to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPC), and duplicates whether spiked or native (LJMB, MSD, SPK, DUP, LDUP, LR).

Data Qualifications, Specifications, and Technical Narratives

The following are quality descriptors that may be used throughout this SDO and are presented with their associated samples in each SDO section as appropriate.

- "D": exceeds the calibration range of the method
- "D": result taken from sample dilution
- "D": concentration reported between the laboratory/instrument determined Method Detection Limit (MDL) and the Concentration of the Practical Quantitation Limit (PQL)/Limit of Quantification (LOQ)
- "MDL": concentration reported below the laboratory/instrument determined Method Detection Limit (MDL)/Limit of Quantification (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "10": analyte concentration in method blank exceeds reporting limit
- "10": analyte not detected Method: 1/LCD
- "10": analyte concentration in method blank exceeds reporting limit
- "M": indicates matrix interference
- "MB": indicates any value between 10% - 15% of acceptance window and results is Not Determined
- "N": matrix spikes or ratios outside 20% acceptance window and results is Not Determined

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blanks (BS, LFB, LCS), matrix spikes (MS, SPC), and duplicates whether spiked or native (LJMB, MSD, SPK, DUP, LDUP, LR).

Data Deliverables

This data package constitutes a Level II package, other data report packages (Level I, Level IV ICP, EPA R5 EDD) are available upon request. There were no hierarchy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Atomic Dilution Gas Chromatography – Mass Spectrometry). An initial dilution with at least five levels was used to quantitate 1,4-dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Assay/Notes:

0001-00222CH_0404221.xls

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for these compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pond 4/7/22

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exception:

- None

Internal Standards and Surrogates - Quantitation

This method utilizes Internal Standards only, not Surrogates. Internal standards assess and validate times met the acceptance criteria with the following exception:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OPR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB/OPR) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exception:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the accuracy acceptance criteria with the following exception:

- None

PRECISION

Matrix Spike and Matrix Spike Duplicate - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the precision acceptance criteria with the following exception:

- None

/ April 11, 2022

Mark T. DeLong (Quality Assurance Coordinator)

/ April 11, 2022

Philip H. Simon (Laboratory Director)

/ April 11, 2022

Mark W. Klotz (Owner)

/ April 11, 2022

John C. Schaeffer (President)

/ April 11, 2022

John C

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY									
LABORATORY ACCURACY SUMMARY									
Name:	USEPA 1624	Sample Batch Number:	00000000000000000000000000000000	QC/QC Batch Number:	00000000000000000000000000000000	Project Number:	G001-002	Report Date:	4/11/22
Project Name:	USEPA 1624	Location ID:	00000000000000000000000000000000	Project Name:	USEPA 1624	Report Date:	4/11/22		
Laboratory Test Block (LFB) / Laboratory Control Sample (LCS) On-Going Precision and Accuracy (D/P)	244	Sample Type:	Control	Test Method:	USEPA 1624	Power (%)	95.0	SD (%)	10.0
Lab Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0
Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0

AT&T 

ANN ARBOR TECHNICAL SERVICES, INC.

Quality Assurance / Quality Control Summary
Laboratory Accuracy Summary

Name:	USEPA 1624	QC/QC Batch Number:	00000000000000000000000000000000	Project Number:	G001-002	Report Date:	4/11/22 <th>Matrix Spike (MSD)</th> <td>1,4-Dioxane</td>	Matrix Spike (MSD)	1,4-Dioxane
Lab Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0
Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0

Data Transmittal Cover Page

Project Name: Pelli Corporation
ATS Project Number: G001-002
ATS Report Number(s): Inorg_SRF_9405221
Client PO Number: 4505179849

Project Description: This data report contains the results of 8 water samples, received by ATS on April 8, 2022 to be analyzed for 1,4-Dioxane.

Recipient: Mr. Greg Trendler Email: greg_trendler@pell.com
FAX Number:

No. of Pages (including cover pg.): 20

From: Sarah Glashoff Email: Sarah_Glashoff@AnnArborTechnicalServices.com
Serie Chemist/Lab Manager FAX Number: 734-955-3731

Additional Message: Copy report to: Pellierson, Keith (keith_pellierson@gmail.com), Brinda, Jim (jim_bri@pell.com)
Kole Strohauer (kstrophy@mgm.com), nretd@tr-operaciona.com, Peters, Sue Peters (sue_peters@pell.com)
Amanda Isabella (amanda_isabella@pell.com)

Date: 4/11/22 Signed: 

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-955-0905.

This document is intended only for the use of the individual or entity to whom it is addressed, and certain information contained is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering this document to the intended recipient, please notify our sender by telephone, fax or e-mail, and do not read, disseminate, distribute or copy any portion of this communication. If you have received this communication in error, please notify us immediately by telephone. Thank you.



ORGANIC ANALYSIS

1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22

ATS SDG: 0405221

Prepared By:
Ann Arbor Technical Services, Inc.
250 South Wagner Road
Ann Arbor, MI 48103

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY									
LABORATORY ACCURACY SUMMARY									
Name:	USEPA 1624	Sample Batch Number:	00000000000000000000000000000000	QC/QC Batch Number:	00000000000000000000000000000000	Project Number:	G001-002	Report Date:	4/11/22
Project Name:	USEPA 1624	Location ID:	00000000000000000000000000000000	Project Name:	USEPA 1624	Report Date:	4/11/22		
Laboratory Test Block (LFB) / Laboratory Control Sample (LCS) On-Going Precision and Accuracy (D/P)	244	Sample Type:	Control	Test Method:	USEPA 1624	Power (%)	95.0	SD (%)	10.0
Lab Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0
Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0

AT&T 

ANN ARBOR TECHNICAL SERVICES, INC.

Quality Assurance / Quality Control Summary
Laboratory Accuracy Summary

Name:	USEPA 1624	QC/QC Batch Number:	00000000000000000000000000000000	Project Number:	G001-002	Report Date:	4/11/22	Matrix Spike (MSD)	1,4-Dioxane
Lab Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0
Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0

LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002
Report Date: 4/11/22
SIRF / SDG Number(s): 8405221
Client PO Number: 4505179849

Case Narrative Summary

This case narrative applies to the following 8 samples that was received at Ann Arbor Technical Services, Inc. (ATS) on 4/05/22, and associated matrix-specific QA/QC.

Keywords:

Client Sample Identification	Sample Date	Requested Time Around Time	Analyst	Matrix
Received 4/05/22				
Overall 001	Urgent	1.4-Dioxane	Water	
RP	Urgent	1.4-Dioxane	Water	
IP	Urgent	1.4-Dioxane	Water	
IP-OCV-1a	Standard	1.4-Dioxane	Water	
IP-OCV-2a	Standard	1.4-Dioxane	Water	
MM-1a	Standard	1.4-Dioxane	Water	
MM-1t	Standard	1.4-Dioxane	Water	
MM-5t	Standard	1.4-Dioxane	Water	
175 Jackson Place	Standard	1.4-Dioxane	Water	

Upon receipt samples were scheduled for the following analysis:

- | Analyst | Number of Samples |
|---|--|
| • 1,4-Dioxane (USEPA 1624) - Urgent TAT | • 4 Samples |
| • 1,4-Dioxane (USEPA 1624) - Standard TAT | • 4 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicates |

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pelli Corporation staff. Samples were received with proper chain of custody. All samples were analyzed within 15 days of arrival and solution, if any, are either presented in the "Simple Acceptance" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exception:

- None

080-002.22-CH-0405221.dwg
Consultancy in Chemistry & Environmental Science
250 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/955-0905 Fax 734/955-3731

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY									
LABORATORY ACCURACY SUMMARY									
Name:	USEPA 1624	Sample Batch Number:	00000000000000000000000000000000	QC/QC Batch Number:	00000000000000000000000000000000	Project Number:	G001-002	Report Date:	4/11/22
Project Name:	USEPA 1624	Location ID:	00000000000000000000000000000000	Project Name:	USEPA 1624	Report Date:	4/11/22		
Laboratory Test Block (LFB) / Laboratory Control Sample (LCS) On-Going Precision and Accuracy (D/P)	244	Sample Type:	Control	Test Method:	USEPA 1624	Power (%)	95.0	SD (%)	10.0
Lab Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0
Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0

AT&T 

ANN ARBOR TECHNICAL SERVICES, INC.

Quality Assurance / Quality Control Summary
Laboratory Precision Summary

Name:	USEPA 1624	QC/QC Batch Number:	00000000000000000000000000000000	Project Number:	G001-002	Report Date:	4/11/22	Matrix Spike (MSD)	1,4-Dioxane
Lab Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0
Sample ID:	00000000000000000000000000000000	Sample ID:	00000000000000000000000000000000	Sample Name:	1,4-Dioxane	Pass (%)	95.0	SD (%)	10.0

Comments: A single O/AQC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blocks (LB), LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK, DUP, LB, LR).

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test methods, are in conformance with detailed procedures described in a written standard operating procedures specific to the ATS Laboratories, as required by USEPA. All data are peer and management reviewed to ensure the compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single O/AQC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blocks (LB), LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK, DUP, LB, LR).

Data Qualifications, Specifications, and Technical Narration

The following are specific descriptions that may be used throughout this SDS and are presented with their associated sample in each SDS section as appropriate.

- "D" – exceeds the calibration range of the method
- "D" – result taken from sample dilution
- "D" – result taken from the laboratory/instrument determined Method Detection Limit (MDL), Limit of Detection (LOD), and the Practical Quantitation Limit (PQL) / Limit Of Quantification (LOQ)
- "D" – concentration reported below the laboratory/instrument Method Detection Limit (MDL) / Limit Of Quantification (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- "D" – analyte concentration in sample exceeds reporting limit
- "I" – instrument detection limit (MDL / LOD)
- "M" – matrix interference
- "M" – indicates matrix interference
- "N" – indicates no detection
- "N" – exceeds the calibration range 30% acceptance window and result is Not Reported

A single O/AQC batch is defined as no more than 20 samples excluding method blanks (MB), fortified blocks (LB), LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK, DUP, LB, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA RS EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

I-Eliminate Analyst (OQAQ): Samples were analyzed by page and trip QCMS as specified with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported in project specific reporting limits. Samples were reported as mg/L.

Anomalous Notes:

G001-002.22-CH-0405221.dwg





Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Inorg_SRF_0408221
 Client PO Number: 4505179640
 Project Description: This data report contains the results of 11 water samples, received by ATS on April 8, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analysis for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures contained in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA, Laboratory data sheets, SDMs, and QA/QC information available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gary Threlkeld Email: gary_threlkeld@pall.com
 FAX Number: _____

No. of Pages (including cover pg.): 23
 From: Sarah Gubalekoff Email: Sarah.Gubalekoff@AnnArborTechnicalServices.com
 Senior Chemist Lab Manager FAX Number: 734-665-3751

Additional Message: Copy report to: Patterson, Keith (keith_patterson@pall.com), Broda, Jim (jm_broda@pall.com)
 Katie Strichauer (kstrichauer@pall.com), woodis@fh-operations.com, Peters, Sue Potens (sue_potens@pall.com)
 Amanda Isabella (amanda_isabella@pall.com)

Date: 4/11/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-665-0995.

The material is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering the material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

A40261-002-220404a_Transmittal_Cover_Page_15of15.xls

ORGANIC ANALYSIS 1,4-Dioxane by GC/MS USEPA 1624



LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 4/11/22
 SRF / SDG Number(s): 0408221
 Client PO Number: 4505179640

This case narrative applies to the following 11 samples that was received at Ann Arbor Technical Services, Inc. (ATS) on 4/8/22, and associated matrix-specific QA/QC:

Sample	Client Sample Identification	Sample Date	Reported Test Amount	Time	Analysis	Matrix
Surveillance	4/8/22					
Control 001		4/7/22	Urgent	1:4-Dioxane	Water	
Ref. Prod.		4/7/22	Urgent	1:4-Dioxane	Water	
L1		4/7/22	Urgent	1:4-Dioxane	Water	
L2		4/7/22	Urgent	1:4-Dioxane	Water	
L3		4/7/22	Urgent	1:4-Dioxane	Water	
Control Check		4/7/22	Urgent	1:4-Dioxane	Water	
TW-35		4/7/22	Standard	1:4-Dioxane	Water	
MW-79a		4/7/22	Standard	1:4-Dioxane	Water	
MW-79b		4/7/22	Standard	1:4-Dioxane	Water	
MW-104		4/7/22	Standard	1:4-Dioxane	Water	
MW-110		4/7/22	Standard	1:4-Dioxane	Water	
MW-101		4/7/22	Standard	1:4-Dioxane	Water	

Upon receipt samples were scheduled for the following analyses.

- Analysts Number of Samples
- 1,4-Dioxane (USEPA 1624) - Urgent TAT 5 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate
 - 1,4-Dioxane (USEPA 1624) - Standard TAT 5 Samples

Sample Receipt, Chain of Custody Records, and Holdline Timeline

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days from the following exceptions:

- None
- G001-002-220404a_0408221.xls

Consultants in Chemistry & Environmental Science
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/665-0995 Fax 734/665-3751

Data Review and Approval

All data contained in this report have been generated in accordance with procedures provided in the referenced standard test method. The laboratory has determined that no deviation is present in the analysis or reporting procedures (SDMs) specific to the ATS Laboratories, as required by USEPA. All data are peer and management reviewed. The laboratory has determined that the above measurement SDPs and project specifications are consistent with the laboratory's Quality Assurance and Quality Control procedures.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (M1, L1B), fortified blanks (L1, L2P, L2S), matrix spikes (MS, SPK), and duplicates whether spiked or native (L3D, M3D, SPK, DUP, L3).

Data Qualifications, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDG and are presented with their associated samples in each table as appropriate:

- "U" – exceeds the calibration range of the method
- "DU" – duplicate flagged as failing
- "T" – concentration reported between the laboratory/instrument determined Method Detection Limit (MDL) and the Project Limit Of Detection (PLD), and the Practical Quantitation Limit (PQL)/Limit Of Quantitation (LOQ) and the Project Limit Of Detection To Noise Ratio (SNR) of approximately 10:1
- "MDL" – concentration reported below the laboratory/instrument determined Method Detection Limit (MDL)/Limit Of Quantitation (LOQ) and the Project Limit Of Detection To Noise Ratio (SNR) of approximately 10:1
- "DU" – analysis continues in method until it exceeds reporting limit
- "U" – analysis not detected above MDL / LOQ
- "DU" – indicates analyte has exceeded batch or sample specific QA/QC control limits
- "T" – indicates analyte is outside 15% acceptance window
- "DU" – indicates ion ratio outside 20% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (M1, L1B), fortified blanks (L1, L2P, L2S), matrix spikes (MS, SPK), and duplicates whether spiked or native (L3D, M3D, SPK, DUP, L3P, L3S).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA 85 EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS) Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Notes:

G001-002-220404a_0408221.xls

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Ref. Prod. 4/7/22
- TW-35 4/7/22
- MW-79a 4/7/22
- MW-104 4/7/22
- MW-110 4/7/22

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exception:

- None

Internal Standards and Surrogates - Quantitation

This method utilizes internal standards only, not surrogates. Internal standards areas and retention times met the acceptance criteria with the following exception:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OPR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB/OPR) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exception:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the precision acceptance criteria with the following exceptions:

- None

PRECISION

Matrix Spike and Matrix Spike Duplicates - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the precision acceptance criteria with the following exception:

- None

Mark T. DeLong (Quality Assurance Coordinator)

Philip D. Simon (Laboratory Director)

April 11, 2022

G001-002-220404a_0408221.xls

Page 1

Sample ID	Sample Name	Sample Type	Sample Date	Reported Test Amount	Time	Analysis	Matrix	Acceptance Criteria		Comments
								Method	Calibration	
1	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
2	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
3	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
4	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
5	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
6	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
7	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
8	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
9	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
10	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
11	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
12	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
13	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
14	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
15	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
16	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
17	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
18	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
19	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
20	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
21	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
22	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
23	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
24	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
25	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
26	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
27	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
28	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
29	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
30	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
31	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
32	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
33	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
34	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
35	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
36	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
37	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
38	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
39	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
40	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
41	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
42	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
43	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
44	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
45	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
46	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
47	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
48	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
49	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
50	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
51	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
52	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
53	1,4-Dioxane (USEPA 1624) - Urgent TAT	Sample	4/7/22	Urgent	1:4-Dioxane	Water		MDL	MDL	
54	1,4-Dioxane (USEPA 1624) - Standard TAT	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
55	1,4-Dioxane (USEPA 1624) - Matrix Spike	Sample	4/7/22	Standard	1:4-Dioxane	Water		MDL	MDL	
56	1,4-Dioxane (USEPA 1624) - Matrix Spike Duplicate	Sample	4/7/22	Standard	1:4-D					

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	USEPA 1626
QA/QC Batch Number:	QCOR/5C053221
SDG:	C43221
Project Number:	C001-002.22
Report Date:	4/15/2022

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPP)

Lot Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Date Measured	Measured Concentration	Units	Precise	Exact	Percent Recovery	SD	UCL	CL	Lower	UCL	Qualifer
LFB-14532	5/4/2022	03:31:28	14-Chloro	102-61-1	0.3100	EE104	0.3100	mg/L	104	104	85	115					

Comments:
All samples received LFB 14532 method detection limit.
Precision sample meeting and LCS based upon linear detection limits.
No precision sample meeting and LCS based upon linear detection limits.

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	USEPA 1626
QA/QC Batch Number:	QCOR/5C053221
SDG:	C43221
Project Number:	C001-002.22
Report Date:	4/15/2022

Matrix Spike (MS)

Lot Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Date Measured	Measured Concentration	Units	Precise	Exact	Percent Recovery	SD	UCL	CL	Lower	UCL	Qualifer
LFB-14532-1	5/4/2022	13:23:57	14-Chloro	102-61-1	0.3100	EE104	0.3100	mg/L	104	104	85	115					

Comments:
All samples received LFB 14532 method detection limit.
Precision sample meeting and LCS based upon linear detection limits.
No precision sample meeting and LCS based upon linear detection limits.

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	USEPA 1626
QA/QC Batch Number:	QCOR/5C053221
SDG:	C43221
Project Number:	C001-002.22
Report Date:	4/15/2022

Matrix Spike (MS)

Lot Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Date Measured	Measured Concentration	Units	Precise	Exact	Percent Recovery	SD	UCL	CL	Lower	UCL	Qualifer
LFB-14532-1	5/4/2022	13:23:57	14-Chloro	102-61-1	0.3100	EE104	0.3100	mg/L	104	104	85	115					

Comments:
All samples received LFB 14532 method detection limit.
Precision sample meeting and LCS based upon linear detection limits.
No precision sample meeting and LCS based upon linear detection limits.

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	USEPA 1626
QA/QC Batch Number:	QCOR/5C053221
SDG:	C43221
Project Number:	C001-002.22
Report Date:	4/15/2022

Matrix Spike Duplicate (MSD)

Lot Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Sample Concentration	Date Measured	Measured Concentration	Units	Precise	Exact	Percent Recovery	SD	UCL	CL	Lower	UCL	Qualifer
LFB-14532-1	5/4/2022	13:23:32	14-Chloro	102-61-1	0.3100	EE104	0.3100	mg/L	104	104	85	115					

Comments:
All samples received LFB 14532 method detection limit.
Precision sample meeting and LCS based upon linear detection limits.
No precision sample meeting and LCS based upon linear detection limits.

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY PRECISION SUMMARY

Method:	USEPA 1626
QA/QC Batch Number:	QCOR/5C053221
SDG:	C43221
Project Number:	C001-002.22
Report Date:	4/15/2022

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Lot Sample ID	Analysis Date	Analysis Time	Chemical Name	CAS	Analysis Type	Units	Exact	SD	CV%	CV%	Qualifer
640231-1	5/4/2022	13:23:32	14-Chloro	102-61-1	Exact	mg/L	104	1.45	1.47	1.47	
640231-1	5/4/2022	13:23:32	14-Chloro	102-61-1	Avg	mg/L	104	1.45	1.47	1.47	22

Comments:
All samples received LFB 14532 method detection limit.
Precision sample meeting and LCS based upon linear detection limits.
No precision sample meeting and LCS based upon linear detection limits.

1,4-Dioxane by GC/MS Data Summary Sheet											
Parameter	CAS#	Result	MDL	PQL	Qual	Parameter	CAS#	Result	MDL	PQL	Qual
Percent Mixture	100.0					Percent Mixture	100.0				
Instrument	2102V					Instrument	2102V				
Subsample (mL)	5.000					Subsample (mL)	5.000				
RF	1.00					Final Volume (mL)	5.000				
Sample ID	045221-1					Final Volume (mL)	5.000				
Matrix	Water					Dilution Factor	1				
Date	5/4/02/22 13:55					Matrix	Water				
Anal Method (USEPA)	USEPA 1624					Sample Date	04/05/2022 10:22				
Prep Method (USEPA)	USEPA 1624					Analytical Method (USEPA)	USEPA 1624				
Preparation Date	04/05/2022					Preparation Method (USEPA)	USEPA 1624				
QC Batch Number	QCGH04040221					QC Batch Number	QCGH04040221				
Analysis Date	04/05/2022 13:33:52					Analysis Date	04/05/2022 13:55:18				

Comments:
 All methods reference 1,4-Dioxane unless otherwise noted.
 Calibration performed prior to analysis.
 Project specific reporting limit (DRL) based upon detection standard.
 QC values measured reporting limit based upon detection standard.

Ann Arbor Technical Services, Inc.
 with Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

1,4-Dioxane by GC/MS Data Summary Sheet											
Parameter	CAS#	Result	MDL	PQL	Qual	Parameter	CAS#	Result	MDL	PQL	Qual
Percent Mixture	100.0					Percent Mixture	100.0				
Instrument	2102V					Instrument	2102V				
Subsample (mL)	3.000					Subsample (mL)	3.000				
RF	1.00					Final Volume (mL)	3.000				
Sample ID	045221-1					Dilution Factor	1				
Matrix	Water					Matrix	Water				
Date	5/4/02/22 13:55					Sample Date	04/05/2022 7:55				
Anal Method (USEPA)	USEPA 1624					Analytical Method (USEPA)	USEPA 1624				
Prep Method (USEPA)	USEPA 1624					Preparation Method (USEPA)	USEPA 1624				
Preparation Date	04/05/2022					QC Batch Number	QCGH04040221				
QC Batch Number	QCGH04040221					Analysis Date	04/05/2022 11:21:40				

1,4-Dioxane by GC/MS Data Summary Sheet											
Parameter	CAS#	Result	MDL	PQL	Qual	Parameter	CAS#	Result	MDL	PQL	Qual
Percent Mixture	100.0					Percent Mixture	100.0				
Instrument	2102V					Instrument	2102V				
Subsample (mL)	3.000					Subsample (mL)	3.000				
RF	1.00					Final Volume (mL)	3.000				
Sample ID	045221-1					Dilution Factor	1				
Matrix	Water					Matrix	Water				
Date	5/4/02/22 13:55					Sample Date	04/05/2022 7:55				
Anal Method (USEPA)	USEPA 1624					Analytical Method (USEPA)	USEPA 1624				
Prep Method (USEPA)	USEPA 1624					Preparation Method (USEPA)	USEPA 1624				
Preparation Date	04/05/2022					QC Batch Number	QCGH04040221				
QC Batch Number	QCGH04040221					Analysis Date	04/05/2022 11:21:40				

1,4-Dioxane by GC/MS Data Summary Sheet											
Parameter	CAS#	Result	MDL	PQL	Qual	Parameter	CAS#	Result	MDL	PQL	Qual
Percent Mixture	100.0					Percent Mixture	100.0				
Instrument	2102V					Instrument	2102V				
Subsample (mL)	5.000					Subsample (mL)	5.000				
RF	1.00					Final Volume (mL)	5.000				
Sample ID	045221-1					Dilution Factor	1				
Matrix	Water					Matrix	Water				
Date	5/4/02/22 13:55					Sample Date	04/05/2022 7:55				
Anal Method (USEPA)	USEPA 1624					Analytical Method (USEPA)	USEPA 1624				
Prep Method (USEPA)	USEPA 1624					Preparation Method (USEPA)	USEPA 1624				
Preparation Date	04/05/2022					QC Batch Number	QCGH04040221				
QC Batch Number	QCGH04040221					Analysis Date	04/05/2022 11:21:40				

1,4-Dioxane by GC/MS Data Summary Sheet											
Parameter	CAS#	Result	MDL	PQL	Qual	Parameter	CAS#	Result	MDL	PQL	Qual
Percent Mixture	100.0					Percent Mixture	100.0				
Instrument	2102V					Instrument	2102V				
Subsample (mL)	5.000					Subsample (mL)	5.000				
RF	1.00					Final Volume (mL)	5.000				
Sample ID	045221-1					Dilution Factor	1				
Matrix	Water					Matrix	Water				
Date	5/4/02/22 13:55					Sample Date	04/05/2022 7:55				
Anal Method (USEPA)	USEPA 1624					Analytical Method (USEPA)	USEPA 1624				
Prep Method (USEPA)	USEPA 1624					Preparation Method (USEPA)	USEPA 1624				
Preparation Date	04/05/2022					QC Batch Number	QCGH04040221				
QC Batch Number	QCGH04040221					Analysis Date	04/05/2022 11:21:40				

Ann Arbor Technical Services, Inc.
 with Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
 200 South Wagner Road
 Ann Arbor, Michigan 48103

Office: 734-695-6995
 Fax: 734-695-3731



1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	0406221-2
Laboratory Sample ID	D406221-2
Matrix	Water
Sample Date	04/06/2022 7:00
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

ATB Project Number

G001-002.22

ATB SIS Number

0406221

Client Sample ID

0406221-2

Laboratory Sample ID

D406221-2

Matrix

Water

Sample Date

04/06/2022 7:00

Analytical Method (USEPA)

USEPA 1024

Preparation Method (USEPA)

USEPA 1024

QC Batch Number

GCDHG0406221

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	0406221
Laboratory Sample ID	D406221-2
Matrix	Water
Sample Date	04/06/2022 7:00
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	0406221
Laboratory Sample ID	D406221-2
Matrix	Water
Sample Date	04/06/2022 7:00
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	0406221
Laboratory Sample ID	D406221-2
Matrix	Water
Sample Date	04/06/2022 11:00
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

Parameter

1,4-Dioxane

CAS# 123-91-1

Result 0.68

MDL 0.04

PQL M

Qual

Parameter

1,4-Dioxane

CAS# 123-91-1

Result 6.005

MDL 0.001

PQL

Qual

Parameter

1,4-Dioxane

CAS# 123-91-1

Result 0.53

MDL 0.04

PQL

Qual

Parameter

1,4-Dioxane

CAS# 123-91-1

Result 4.0

MDL 0.05

PQL

Qual

Comments

All methods reference USEPA Laboratory guidance for detection limit.

Calibration performed prior to analysis.

No blank sample was run.

M - indicates measured reporting limit based upon sample dilution.

Comments

All methods reference USEPA Laboratory guidance for detection limit.

Calibration performed prior to analysis.

No blank sample was run.

M - indicates measured reporting limit based upon sample dilution.

Comments

All methods reference USEPA Laboratory guidance for detection limit.

Calibration performed prior to analysis.

No blank sample was run.

M - indicates measured reporting limit based upon sample dilution.

Comments

All methods reference USEPA Laboratory guidance for detection limit.

Calibration performed prior to analysis.

No blank sample was run.

M - indicates measured reporting limit based upon sample dilution.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	MW-104
Laboratory Sample ID	D406221-7
Matrix	Water
Sample Date	04/06/2022 10:26
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

ATB Project Number

G001-002.22

ATB SIS Number

0406221

Client Sample ID

MW-104

Laboratory Sample ID

D406221-7

Matrix

Water

Sample Date

04/06/2022 10:26

Analytical Method (USEPA)

USEPA 1024

Preparation Method (USEPA)

USEPA 1024

QC Batch Number

GCDHG0406221

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	MW-104
Laboratory Sample ID	D406221-7
Matrix	Water
Sample Date	04/06/2022 10:26
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	MW-104
Laboratory Sample ID	D406221-7
Matrix	Water
Sample Date	04/06/2022 10:26
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

1,4-Dioxane by GC/MS

Data Summary Sheet

ATB Project Number	G001-002.22
ATB SIS Number	0406221
Client Sample ID	MW-104
Laboratory Sample ID	D406221-7
Matrix	Water
Sample Date	04/06/2022 10:26
Analytical Method (USEPA)	USEPA 1024
Preparation Method (USEPA)	USEPA 1024
QC Batch Number	GCDHG0406221

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103Office: 734-995-0055
Fax: 734-995-3731

1,4-Dioxane by GC/MS
Data Summary Sheet

Job Number:	0409100222	Percent Mixture:	100.0
Date:	04/12/02	Instrument:	2100D
Sample ID:	123-01-1	Sample Size (ml):	2.000
Recovery Sample ID:	0409022115	Piston Volume (ml):	0.000
Water:		Dilution Factor:	10
State:		Scale:	kg
Method (USP/PA):	USP/PA 1034	Unit:	ug/g
Preparation Method (USP/PA):	USP/PA 1034	Preparation Date:	0409100222
Ch Number:	DCR050406221	Analysis Date:	04/12/02 09:01:37

RF _____ Case _____ Result: 0.09 _____ MSL: 0.01 _____ PGL: _____ Qual: M

Notes:
1. Reference peak(s) were not detected.
2. Estimated peak(s) were not detected.
3. No reference peak(s) were present to calculate detection limit.

Aurum Technical Services, Inc.
600 Wagner Road
Kenosha, Wisconsin 41042

Office: 734-695-0885
Fax: 734-695-3731

Inorganic Analysis Data Summary Sheet					
ATS Project: Pall Corporation G001-002					
Report Date: 4/18/22		Pall Corporation		G001-002	
ATS SRF: 0411221					
Sample Identification: Outfall Creek					
Date:	4/18/22	Time:	na	Analyst:	na
Sample Type:	Client	Client ID:	411222	Analysis Time:	16:20 DMS
Matrix:	Water	Sample ID:		Analyst Name:	
Method:	EPN 200.7	Units:	mg/L	Result:	Yes
Method Revision:	EPN 200.7	Reporting Limit:	0.021	Analysis Date:	4/18/22
Method Revision:	EPN 200.7	Analysis Time:	16:20	Analyst:	DMS
Method Revision:	EPN 200.7	Sample ID:		Analyst Name:	

Comments:
 • Method reference (US EPA method, unless otherwise noted).
 • Precision not available / not applicable.

G001-002-22Apr_SampleBatch_SRF_041122

Quality Assurance / Quality Control Data Summary

QC Batch Number: OCINOR02413221 Parameter: Return (US EPA 200.7) Report Date: 4/18/22					
ATS Project: Pall Corporation G001-002					
Results of QA Samples run concurrently with project samples					
REPLICATE ANALYSIS					
Sample	Replicate #1	Replicate #2	Mean	Relative Range (percent)	
#G001-002 Outfall Creek Matrix Spike	1.8 mg/L	1.8 mg/L	1.8 mg/L	4.3	
SPIKES and/or QC CHECK SAMPLES					
Sample/Analyte	Known Concentration	Spike Concentration	Analyzed Concentration	Recovery (percent)	
#G001-002 Laboratory Reagent Blank	<0.001 mg/L	1.8 mg/L	1.7 mg/L	104.1	
Outfall Creek Matrix Spike	0.18 mg/L	1.8 mg/L	1.8 mg/L	104.2	
Outfall Creek Matrix Spike Duplicate	0.18 mg/L	1.8 mg/L	1.8 mg/L	104.4	
BLANK ANALYSIS					
Sample	Analyzed Concentration		QC Decision		
#G001-002 Laboratory Reagent Blank	<0.001 mg/L		Acceptable		
Comments: Calculations performed prior to rounding.					
Control Limits: Recovery range: Laboratory Reagent Blank (85 - 115 %) Matrix Spike (75 - 125 %) Relative Range: Acceptance (>90%)					

KNS001-002-22Apr_SampleBatch_SRF_041122

rec: 4/18/22

4/18/22



LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 4/18/22
 SRF / SDG Number(s): 0411221
 Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 5 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 4/18/22, and associated matrix-specific QA/QC.

Sample Identification	Sample Date	Reported Time Amt/Time	Analysis	Matrix
Received: 4/18/22	4/18/22	11:00 AM	14-Dioxane	Water
14-Dioxane	4/18/22	11:00 AM	14-Dioxane	Water
Bad Pwdl	4/18/22	11:00 AM	14-Dioxane	Water
LFB/OPR-1a	4/18/22	11:00 AM	14-Dioxane	Water
LFB/OPR-2a	4/18/22	11:00 AM	14-Dioxane	Water
Outfall Creek	4/18/22	11:00 AM	14-Dioxane	Water

Upon receipt samples were scheduled for the following analysis.

Analysts: Number of Samples
 • 14-Dioxane (USEPA 1624) - Digest TAT * 5 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody report attached. Chain of custody information, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

* None

Data Review and Approval

All data contained in this report have been generated in accordance with quality control procedures as defined in standard test methods, and are consistent with detailed procedures described in a written standard operating procedure (SOP) provided to the ATS Laboratory, as required by USEPA. All data are peer reviewed and revised to ensure compliance with the above referenced SOP's and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manuals.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (ML, LRB), fortified blanks (LB, LFB, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MD, MSD, DUP, LDU, LR).

Data Qualifiers, Specifications, and Technical Narration

The following are qualifier descriptions that may be used throughout this SDS and are presented with their associated samples in each SDS section as appropriate.

- * = exceeds the calibration range of the method
- † = result taken from sample duplicate
- ‡ = result taken from the laboratory/contractor determined Method Detection Limit (MDL), Limit Of Detection (LOD), and the Practical Quantitation Limit (PQL), Limit Of Quantitation (LOQ)
- = result = concentration reported below the laboratory/instrument Method Detection Limit (MDL), Limit Of Quantitation (LOQ) and the instrument Signal To Noise Ratio (S/N) of approximately 10 : 1
- *# = analysis conducted at the method detection or reporting limit
- *# = analysis conducted at the method detection or reporting limit
- ** = indicates analysis has exceeded batch or sample specific QA/QC control limits
- *** = indicates matrix interference
- **** = indicates ion interference
- *N* = indicates ion ratio outside 50% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (ML, LRB), fortified blanks (LB, LFB, LCS), matrix spikes (LFM, MS, SPK), and duplicates whether spiked or native (LFD, MSD, DUP, LDU, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

Sample Analysis

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

Data Review and Approval

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA-RI ED0) are available upon request. There were no backlog data summary sheets generated for this project.

14-Dioxane Analysis (ED2403): Samples were analyzed by purge and trap (P&T) GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 14-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Analytical Note:

- * None

- Requested Turn-Around Time Priority Number Key: 1 = Urgent 2 = Rush 3 = Standard



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

From: [Frank Gage](mailto:Frank.Gage@usgs.gov) <Frank.Gage@usgs.gov>
Sent: Monday, April 1, 2013 1:19 PM
To: [Terry Durung](mailto:Terry.Durung@usgs.gov); Mark.Durung.Terry.Durung@usgs.gov
Cc: [David Wilcox](mailto:David.Wilcox@usgs.gov); [John Bradley](mailto:John.Bradley@usgs.gov)
Subject: <http://www.ccc-2012.usgs.gov>

In an Oral Oral Grade, We Baked Up A "Oral Oral Grade" Instead of Adam's 90.
So far so good.

Thanks for helping this to my attention! I assumed the table that was on it was the way it's always been listed.
Just keep everything lined with how it's been done in the past.

Chemical Trends

642 E. Warner Road, Aliso Viejo, CA 92656
O: 714.537.7101 F: 714.537.7105

From: Jim Bradley <jimbradley@usgsboreridgemanagement.com>
To: [Frank Gage](mailto:Frank.Gage@usgs.gov) <Frank.Gage@usgs.gov>
Subject: RE: <http://www.ccc-2012.usgs.gov>

This message is from an External Sender.

The messages are not checked for viruses. Use caution when opening.

Greg,

I am preparing the reports from last week. The bottom sample has a sample name of Adam's with a sample date of 4/2/13. I don't see any indication of whether it's a grader or a composite. Do you want me to keep it as one large item and list it as a composite or a grader?

I actioned the sample item after 2013 was out on for grabs/more

Frank Gage Frank.Gage@usgs.gov
Sent: Monday, April 1, 2013 1:19 AM
To: [Terry Durung](mailto:Terry.Durung@usgs.gov); Mark.Durung.Terry.Durung@usgs.gov
Cc: [David Wilcox](mailto:David.Wilcox@usgs.gov); [John Bradley](mailto:John.Bradley@usgs.gov)
Subject: <http://www.ccc-2012.usgs.gov>

Troy, Greg <greg.usgs@gmail.com>
Mon Apr 1 11:19 PM
Ric Pohl CCC-2012
<http://www.ccc-2012.usgs.gov>



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY BLANK SUMMARY											
Method	USEPA 1624	QAQC Batch Number	QCR0111021	Sample ID	111251	Sample Name	Blank	Test Date	Report Date		
Proud Number:	G001-03222										
Report Date:	4/16/2022										
Laboratory Reagent Blank (LRB) / Method Blank (MB)											
Lab Sample ID	Analyte Name	Analyte Type	Chemical Name		CAS	Result	Units	Units	Method Detection Limit	Reporting Detection Limit	Qualifier
UR-B-1111022	64/11/2022	2018/04	1,4-Dioxane		125-81-1		mg/L	ml/L	0.021		



Date:	
4/10/22	
Signed:	
IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMISSION, PLEASE CALL 714-572-2505.	
<p>This transmission is intended for the individual or entity named in the recipient information and no other. It is confidential and contains neither recommendations nor conclusions of the sender. The sender reserves the right to withdraw or amend any part of this transmission at any time prior to its receipt by the recipient. This message may be monitored for law enforcement purposes. Please do not forward this transmission to another person.</p>	
From: Brianne Smith Relationship Manager Direct Dial: 714-572-2505 Fax Number: 714-572-3371 Brianne.Smith@BancWest.com www.bancwest.com Brianne.Smith.BancWest@gmail.com	

Data Transmission Cover Page	
Project Description:	Project Name: Pall Corporation ATS Project Number: G001-502 Client ID Number: ORL 9412231
We certify that the example envelope for this project from General Mills in accordance with guidelines provided by ATS and the Contracting Authorities, contains an L-12 transmission. The message is being sent by GDS, Lantech, and Rensco. DGS, and GDS/C are available for messaging and sending to the Authority's system. United Parcel Service (UPS) is also available for the delivery of messages and handling non-envelopes when deemed necessary.	
Recipient:	Mr. Craig Tavel
Email:	[REDACTED]
FAX Number:	[REDACTED] http://www.pall.com

Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Org_SRF_0413221
Client PO Number: 4505178649

Project Description: This data report contains the results of 9 water samples, received by ATS on April 13, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analysis for this report have been conducted in accordance with guidelines provided in the referenced standard method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS laboratory, as required by USEPA. All data are peer and management reviewed, and are consistent with above referenced SOP's and specific specifications. In addition, all data conforms to the laboratory's Quality Assurance / Quality Control Manuals.

Recipient:	Mr. George Trenkel	Email:	george_trenkel@gmail.com
FAX Number:			
No. of Pages (Including cover pg.):	21		
From:	Sarah Shuhfeld	Email:	Sarah_Shuhfeld@AnnArborTechnicalServices.com
		FAX Number:	734-995-0791
Additional Message: Copy report to: Patterson, Keith (keith_patterson@usail.com), Brode, Jim (jm_brode@usail.com), Katie Stinchauer (katie_stinchauer@usail.com), nevow@tv-operations.com, Pivato, Gina Polino (gina_polino@usail.com), Amanda Hallura (amanda_hallura@usail.com)			

Date: 4/18/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-995-0995.

This document is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering this material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

X001-002.220418_Trenkel_Cover_Page.DOC



ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22

ATS SDG: 0413221



LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
Report Date: 4/18/22
SRF / SDG Number(s): 0413221
Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 9 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 4/13/22, and associated matrix-specific QA/QC.

Samples

Client Sample Identification	Sample Date	Reported Test Amount/Time	Analyte	Matrix
Received: 4/13/22				
Q101-002	4/17/22	Urgent	1,4-Dioxane	Water
Q102-002	4/17/22	Urgent	1,4-Dioxane	Water
Q103-002	4/17/22	Urgent	1,4-Dioxane	Water
Q104-002	4/17/22	Urgent	1,4-Dioxane	Water
Q105-002	4/17/22	Urgent	1,4-Dioxane	Water
Q106-002	4/17/22	Standard	1,4-Dioxane	Water
MW-161	4/17/22	Standard	1,4-Dioxane	Water
MW-162	4/17/22	Standard	1,4-Dioxane	Water
MW-163	4/17/22	Standard	1,4-Dioxane	Water
MW-164	4/17/22	Standard	1,4-Dioxane	Water
MW-165	4/17/22	Standard	1,4-Dioxane	Water

Upon receipt samples were scheduled for the following analyses.

- | | |
|---|---|
| Analyte | Number of Samples |
| 1,4-Dioxane (USEPA 1624) - Urgent/TAT | 5 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate |
| 1,4-Dioxane (USEPA 1624) - Standard/TAT | 4 Samples |

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and timestamp, if any, are either presented in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

* None

G001-002.22CN_0413221.doc

Comments in Chemistry & Environmental Science
290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/995-0995 Fax 734/995-3791

Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY / QUALITY CONTROL SUMMARY

Method	QA/QC Batch Number	QA/QC Batch Date	QC	SPK	MSD	DUP	LDR	SPK	MSD	DUP	LDR	SPK	MSD	DUP	LDR
USEPA 1624	G001-002.221	4/13/22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Number	0413221	4/13/2022													
Report Date	4/18/2022														
Matrix Spike (MSD)															
Lab Sample ID	4505179649	4/13/22	1,4-Dioxane												
Location ID	4505179649	4/13/22	1,4-Dioxane												
Location Name	1,4-Dioxane	4/13/22	1,4-Dioxane												
Sample ID	4505179649	4/13/22	1,4-Dioxane												
Sample Name	1,4-Dioxane	4/13/22	1,4-Dioxane												
Sample Type	Water	4/13/22	1,4-Dioxane												

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY PRECISION SUMMARY

Method	QA/QC Batch Number	QA/QC Batch Date	QC	SPK	MSD	DUP	LDR	SPK	MSD	DUP	LDR	SPK	MSD	DUP	LDR
USEPA 1624	G001-002.221	4/13/22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Number	0413221	4/13/2022													
Report Date	4/18/2022														
Matrix Spike (MSD)															
Lab Sample ID	4505179649	4/13/22	1,4-Dioxane												
Location ID	4505179649	4/13/22	1,4-Dioxane												
Location Name	1,4-Dioxane	4/13/22	1,4-Dioxane												
Sample ID	4505179649	4/13/22	1,4-Dioxane												
Sample Name	1,4-Dioxane	4/13/22	1,4-Dioxane												
Sample Type	Water	4/13/22	1,4-Dioxane												

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY PRECISION SUMMARY

Method	QA/QC Batch Number	QA/QC Batch Date	QC	SPK	MSD	DUP	LDR	SPK	MSD	DUP	LDR	SPK	MSD	DUP	LDR
USEPA 1624	G001-002.221	4/13/22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Project Number	0413221	4/13/2022													
Report Date	4/18/2022														
Matrix Spike (MSD)															
Lab Sample ID	4505179649	4/13/22	1,4-Dioxane												
Location ID	4505179649	4/13/22	1,4-Dioxane												
Location Name	1,4-Dioxane	4/13/22	1,4-Dioxane												
Sample ID	4505179649	4/13/22	1,4-Dioxane												
Sample Name	1,4-Dioxane	4/13/22	1,4-Dioxane												
Sample Type	Water	4/13/22	1,4-Dioxane												



G001-002.22CN_0413221.docx



1,4-Dioxane by GC/MS
Data Summary Sheet

Project Number	G001-002-22
EDS Number	0011221
Client Sample ID	0011221-1
Matrix	Water
Sample Date	04/11/2022 7:23
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
Batch Number	G00100411221
Analysis Date	04/11/2022 16:25:01

Instrument: 7100V
Volume (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 40
Matrix: Water
Sample Data: 04/11/2022 7:23
Analytical Method (USEPA): USEPA 1624
Preparation Method (USEPA): USEPA 1624
QC Batch Number: G00100411221

Parameter: 1,4-Dioxane
Result: 0.04
MDL: 0.04
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	G001-002-22
Client Sample ID	0412221
Matrix	Outfall
Sample Date	04/12/2022-1
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G00100411221

Percent Mixture: 100.0
Instrument: 7100V
Subsample (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 40
Matrix: Water
Basis: mg/L
Units: mg/L
Preparation Date: 04/12/2022
Preparation Method (USEPA): USEPA 1624
Analysis Date: 04/12/2022 14:02:12

Parameter: 1,4-Dioxane
Result: 0.008
MDL: 0.001
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	G001-002-22
Client Sample ID	0412221
Matrix	Outfall
Sample Date	04/12/2022-2
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G00100411221

Percent Mixture: 100.0
Instrument: 7100V
Subsample (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 40
Matrix: Water
Basis: mg/L
Units: mg/L
Preparation Date: 04/12/2022
Preparation Method (USEPA): USEPA 1624
Analysis Date: 04/12/2022 14:48:18

Parameter: 1,4-Dioxane
Result: 0.012
MDL: 0.003
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	G001-002-22
Client Sample ID	MW-1122
Matrix	Water
Sample Date	04/11/2022 16:25
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G00100411221

Percent Mixture: 100.0
Instrument: 7100V
Subsample (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 1
Matrix: Water
Basis: mg/L
Units: mg/L
Preparation Date: 04/11/2022
Preparation Method (USEPA): USEPA 1624
Analysis Date: 04/11/2022 16:25:21

Parameter: 1,4-Dioxane
Result: 0.003
MDL: 0.001
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

Project Number	G001-002-22
EDS Number	0412221
Client Sample ID	MW-1122
Matrix	Water
Sample Date	04/11/2022 16:25
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
Batch Number	G00100411221
Analysis Date	04/11/2022 20:19:26

Instrument: 7100V
Volume (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 1
Matrix: Water
Sample Data: 04/11/2022 16:25
Analytical Method (USEPA): USEPA 1624
Preparation Method (USEPA): USEPA 1624
QC Batch Number: G00100411221

Parameter: 1,4-Dioxane
Result: 0.002
MDL: 0.001
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	G001-002-22
Client Sample ID	0412221
Matrix	MW-1121
Sample Date	04/12/2022-1
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G00100411221

Percent Mixture: 100.0
Instrument: 7100V
Subsample (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 1
Matrix: Water
Basis: mg/L
Units: mg/L
Preparation Date: 04/12/2022
Preparation Method (USEPA): USEPA 1624
Analysis Date: 04/12/2022 21:02:29

Parameter: 1,4-Dioxane
Result: 0.003
MDL: 0.001
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	G001-002-22
Client Sample ID	0412221
Matrix	Water
Sample Date	04/12/2022-2
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G00100411221

Percent Mixture: 100.0
Instrument: 7100V
Subsample (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 1
Matrix: Water
Basis: mg/L
Units: mg/L
Preparation Date: 04/12/2022
Preparation Method (USEPA): USEPA 1624
Analysis Date: 04/12/2022 21:46:26

Parameter: 1,4-Dioxane
Result: 0.056
MDL: 0.001
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	G001-002-22
Client Sample ID	MW-1122
Matrix	Water
Sample Date	04/11/2022 16:25
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G00100411221

Percent Mixture: 100.0
Instrument: 7100V
Subsample (mL): 5.000
Final Volume (mL): 5.000
Dilution Factor: 1
Matrix: Water
Basis: mg/L
Units: mg/L
Preparation Date: 04/11/2022
Preparation Method (USEPA): USEPA 1624
Analysis Date: 04/11/2022 16:25:21

Parameter: 1,4-Dioxane
Result: 0.057
MDL: 0.001
PQL: M
Qual: M

Comments:
All methods reference (1,4-Dioxane) method unless otherwise noted.
M - indicates reporting limit (MDL) based upon sample detection.
M - indicates reporting limit (PQL) based upon sample detection.



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	5.000
Final Volume (mL)	0.000	Final Volume (mL)	5.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 11:40:54	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.47 0.01 0.01 M

Parameter

1,4-Dioxane

123-61-1 0.11 0.005 0.005 M

Comments:

Instrumental detection (Q1/4) method unless otherwise noted.

Calibration performed prior to analysis.

Concentrations reported are based on dilution standard.

M = indicates detected (by Q1/4 based open sample dilution).

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	5.000
Final Volume (mL)	0.000	Final Volume (mL)	5.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 14:42:02	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.11 0.005 0.005 M



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	5.000
Final Volume (mL)	0.000	Final Volume (mL)	5.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 15:06:03	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.31 0.005 0.005 M

Comments:

Instrumental detection (Q1/4) method unless otherwise noted.

Calibration performed prior to analysis.

Concentrations reported are based on dilution standard.

M = indicates detected (by Q1/4 based open sample dilution).



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	5.000
Final Volume (mL)	0.000	Final Volume (mL)	5.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 10:56:03	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.32 0.01 0.01 M

Comments:

Instrumental detection (Q1/4) method unless otherwise noted.

Calibration performed prior to analysis.

Concentrations reported are based on dilution standard.

M = indicates detected (by Q1/4 based open sample dilution).



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	2.000
Final Volume (mL)	0.000	Final Volume (mL)	2.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 10:53:08	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.42 0.04 0.01 M

Parameter

1,4-Dioxane

123-61-1 0.007 0.001 0.001 M

Comments:

Instrumental detection (Q1/4) method unless otherwise noted.

Calibration performed prior to analysis.

Concentrations reported are based on dilution standard.

M = indicates detected (by Q1/4 based open sample dilution).



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	2.000
Final Volume (mL)	0.000	Final Volume (mL)	2.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 11:05:29	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.007 0.001 0.001 M



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	MW-05	Subsample (mL)	2.000
Final Volume (mL)	0.000	Final Volume (mL)	2.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 11:05:29	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.002 0.001 0.001 M

Comments:

Instrumental detection (Q1/4) method unless otherwise noted.

Calibration performed prior to analysis.

Concentrations reported are based on dilution standard.

M = indicates detected (by Q1/4 based open sample dilution).



1,4-Dioxane by GC/MS
Data Summary Sheet

ATSL Project Number	QDR140222	Percent Mixture	100.0
ATSL Job Number	0413221	Instrument	2104V
Client Sample ID	Outfall	Subsample (mL)	5.000
Final Volume (mL)	0.000	Final Volume (mL)	5.000
Dilution Factor	10	Dilution Factor	10
Matrix	Water	Matrix	Water
Sample Date	04/17/2022 10:55	Basis	Weight
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/17/2022
Analysis Date	04/17/2022 10:56:40	QC Batch Number	QCDR0413221

CAS# Result MDL PQL Qual

123-61-1 0.002 0.001 0.001 M

Comments:

Instrumental detection (Q1/4) method unless otherwise noted.

Calibration performed prior to analysis.

Concentrations reported are based on dilution standard.

M = indicates detected (by Q1/4 based open sample dilution).

1,4-Dioxane by GC/MS
Data Summary Sheet

Job Number	G081-002-22	Percent Moisture	100.0
Sample ID	G415221	Instrument	7100R
g Sample ID	241522	Run Date/Time	04/15/2022 11:32:42
Spec	Water	Final Volume (ml.)	5.000
Method (USEPA)	6010-12A	Dilution Factor	40
Int Method (USEPA)	6010-12A	Salts	Wet
Number	G081-002-22	PMT	40
		Preparation Date	04/15/2022
		Analyze Date	04/15/2022 11:32:42

GAM

MOL

POL

QCL

ANSI (A) LFA methods were effectively used.
In reporting, the USEPA should be used.
Sampling, handling, and testing were conducted in accordance with USEPA methods.

Jes-Tech Services, Inc.
with Wagner Rain
Hart, Michigan 48112

Office: 734-922-2055
Fax: 734-922-3721

ATS Project Number: G001-002
Report Date: 4/25/22
SRF / SDG Number(s): 0420221
Client PO Number: 4505179649

Case Narrative Summary
This case narrative applies to the following 9 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 4/20/22, and associated matrix-specific QA/QC:

Sample ID	Chemical Sample Identification	Sample Date	Received Date/Accordance	Analysis	Matrix
Received 4/20/22	1 Offcut 001	4/19/22	Urgent	1-Dioxane	Water
	Red Pore	4/19/22	Urgent	1-Dioxane	Water
	F1010C1-1a	4/19/22	Urgent	1-Dioxane	Water
	F1010C1-2a	4/19/22	Urgent	1-Dioxane	Water
	Quartz Flock	4/19/22	Standard	1-Dioxane	Water
	MW-101a	4/19/22	Standard	1-Dioxane	Water
	MW-101b	4/19/22	Standard	1-Dioxane	Water
	2819 Duster Rd.	4/19/22	Standard	1-Dioxane	Water
	MW-101f	4/19/22	Standard	1-Dioxane	Water

Upon receipt samples were scheduled for the following analyses.

- | | |
|---|---|
| <ul style="list-style-type: none"> • 1-Dioxane (USEPA 1624) - Urgent TAT • 1-Dioxane (USEPA 1624) - Standard TAT • 5 Samples | <ul style="list-style-type: none"> • 1 Matrix Spike + 1 Matrix Spike Duplicate |
|---|---|

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample specific information, if any, was stated presented in the "Preliminary section" of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days with the following exceptions:

- | | |
|--|---|
| <ul style="list-style-type: none"> • None | <ul style="list-style-type: none"> • 5 Samples = 1 Matrix Spike + 1 Matrix Spike Duplicate |
|--|---|

G001-002.22Data_Transmittal_Cover_Page 01.dte
290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/995-3731 Fax 734/995-3731

Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Org_SRF_0420221
Client PO Number: 4505179649

Project Description: This data report contains the results of 9 water sample, received by ATS on April 20, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analysis for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the laboratory, as required by USEPA. All data are peer and management reviewed to ensure compliance with the above referenced USEPA SOP and project specifications. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

Additional Message: Copy report to: Patterson, Keith (Keith.Patterson@pall.com), Brada, Jim (Jim.Brada@pall.com)
Katie Shubinski (katie.shubinski@pall.com), nevin@2b-operations.com, Peters, Sue Peters (sue.peters@pall.com)
Amanda Isabella (amanda.isabella@pall.com)

Date: 4/25/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-995-3731.

This message is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the right recipient for delivering the material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received the communication in error, please notify us immediately by telephone. Thank You.

X0001-002.22Data_Transmittal_Cover_Page 01.dte

Sample Dilutions

Samples containing compounds at concentrations above the initial calibration curve were diluted and reanalyzed for those compounds. The following samples were diluted for 1,4-Dioxane:

- Red Pore 4/19/22
- MW-101a 4/19/22
- MW-101f 4/19/22
- 2819 Duster Rd. 4/19/22

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exception:

- None

Internal Standards and Surrogates - Quantitation

This method utilizes Internal Standards only, not Surrogates. Internal standards areas and retention times met the acceptance criteria with the following exception:

- None

ACCURACY

Laboratory Fortified Blanks (LFB/OPR) Laboratory Control Samples - Accuracy

A laboratory fortified blank (LFB/OPR) was analyzed as part of the QA/QC batch. The LFB/OPR met the acceptance criteria with the following exception:

- None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the accuracy acceptance criteria with the following exception:

- None

1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Liquid Dilution Gas Chromatography - Mass Spectrometry). An initial calibration curve was run for each instrument 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as mg/L.

Anomalous Notes:
• None

G001-002.22CN_0420221.dte



G001-002.22Data_Transmittal_Cover_Page 01.dte



ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

1,4-Dioxane by GC/MS
USEPA 1624

ATS Project Number: G001-002.22

ATS SDG: 0420221

Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103

PRECISION

Matrix Spike and Matrix Spike Duplicate - Precision

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD met the precision acceptance criteria with the following exception:

Sample ID	Acceptance Method	Conc. (ppm)	RSD%	Acceptance Limits
MS001-1_MG4691	USEPA 1624	1,4-Dioxane	73.0	± 20%

Mark DeLong

April 25, 2022

Mark T. DeLong (Quality Assurance Coordinator)

Philip D. Simon (Laboratory Director)

April 25, 2022

CHAIN OF CUSTODY RECORD

Sample ID	Accepted By	Accepted Date	Initial Calibration Curve		Final Calibration Curve		Matrix Spike		Matrix Spike Duplicate		1,4-Dioxane	
			1	2	1	2	1	2	1	2	1	2
1 Offcut 001	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
Red Pore	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
F1010C1-1a	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
F1010C1-2a	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
Quartz Flock	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
MW-101a	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
MW-101b	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
2819 Duster Rd.	MD	4/19/22	100	100	100	100	100	100	100	100	100	100
MW-101f	MD	4/19/22	100	100	100	100	100	100	100	100	100	100

* = Requested Test Around Time Priority Number 1 = Urgent 2 = Rush 3 = Standard

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

ANN ARBOR TECHNICAL SERVICES, INC.

LABORATORY PRECISION SUMMARY

Ann Arbor Technical Services, Inc. Laboratory Precision Summary									
Method	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
ATSP-A24	G001-002	G001-002221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane
Matrix Spike (W/S) Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane

Printed on 4/25/2022 at 10:45 AM. This document contains neither recommendations nor conclusions of the Michigan Department of Environment, Great Lakes, and Energy. It has been reviewed by the department and approved for external distribution.

Ann Arbor Technical Services, Inc. Quality Assurance/Quality Control Summary									
Method	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
ATSP-A24	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane
Matrix Spike (W/S) Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane

Printed on 4/25/2022 at 10:45 AM. This document contains neither recommendations nor conclusions of the Michigan Department of Environment, Great Lakes, and Energy. It has been reviewed by the department and approved for external distribution.



Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Org_SRG_5421221
 Client PO Number: 4505178649

Project Description: This data report contains the results of 5 water sample, received by ATS on April 21, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the test method standard listed and in compliance with quality procedures established in a written Standard Operating Procedure (SOP) for the analysis of 1,4-Dioxane. Laboratory quality assurance, SDPQ, and QAQC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Greg Trindal Email: greg_trindal@pall.com

FAX Number: _____

No. of Pages (including cover pg.): 17

From: Sarah Shabotoff Email: Sarah_Shabotoff@AnnArborTechnicalServices.com

FAX Number: 734-695-3731

Additional Message: Copy report to: Patterson, Keith (keith_j_patterson@pall.com), Broda, Jim (jm_broda@pall.com), Kelli Johnson (kelli_johnson@pall.com), mewett@r-pcpartners.com, Peters, Sue Peters (sue_peters@pall.com), Amanda Isakson (amanda_isakson@pall.com)

Date: 4/25/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-695-0995.

This material is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering the material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

X:\QSP\001-002\2022\One\Transmittal_Cover_Page.GLS4

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method:	US EPA 1624	QA/PC Batch Number:	QC/QC Batch Number:	SDG	Project Number:	Report Date:	Lab Name:	Sample Type:	Sample ID:	Sample Description:
Quartz	G001-002	G001-00221	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
SDC2021-14	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	
Matrix Spike Duplicate (W/S)	ATSP-A24	ATSP-A24	050	0421221	4/25/22	Ann Arbor Technical Services, Inc.	Water	12345	14-Dioxane	

ATS Project Number: G001-002.22
 ATS SDG: 0421221
 Case Narrative Summary
 This case narrative applies to the following 5 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 4/25/22, and associated matrix-specific QA/QC.

Event Sample Identification	Sample Date	Requested Turn Around Time	Analyst	Matrix
0421221	4/25/22	Urgent	14-Dioxane	Water
0421221	4/25/22	Urgent	14-Dioxane	Water
0421221	4/25/22	Urgent	14-Dioxane	Water
0421221	4/25/22	Urgent	14-Dioxane	Water
0421221	4/25/22	Urgent	14-Dioxane	Water

Upon receipt samples were scheduled for the following analyses.

- 1,4-Dioxane (USEPA 142) - Urgent TAT
- 1 Sample + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either present in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days of the following exceptions:

- None

Data Review and Approval

All data contained in this report have been generated in accordance with guidelines provided in the referenced standard test method, and are consistent with detailed procedures described in a written standard operating procedure (SOP) specific to the ATS Laboratory, as recorded by USEPA. All data are peer and management reviewed prior to finalization and submission to the USEPA or other government specification. In addition, all data conform to the laboratory's Quality Assurance / Quality Control Manual.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB), LRBs, fortified blanks (LB), LFBs, LCs), matrix spikes (MS, SPK), and duplicates whether spiked or native (MSD, SPK DLP, DLP, LR).

Data Qualifications, Specifications, and Technical Narration

The following are qualitative descriptions that may be used throughout this SDO and are presented with their associated sample in each SDO section as appropriate:

- * "H" - exceeds the calibration range of the method
- * "D" - result taken from sample dilution
- * "P" - concentration reported between the laboratory/instrument determined Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL/Limit Of Quantitation (LOQ))
- * "NDL" - concentration reported below the laboratory/instrument Method Detection Limit (MDL/Limit Of Quantitation (LOQ)) and is assigned a Signal To Noise Ratio (SNR) of approximately 10:1
- * "R" - analyte concentration in method blank exceeds reporting limit
- * "N" - analyte not detected above MDL / LOD
- * "M" - indicates matrix interference
- * "T" - indicates ion ratio between 15 and 30 % acceptance window
- * "R" - indicates ion ratio outside 30% acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LRB), fortified blanks (LB), LFBs, LCs), matrix spikes (MS, SPK), and duplicates whether spiked or native (LFMD, MSD, SPK DLP, DLP, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DDP, EPA R3 EDD) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample analysis
1,4-Dioxane Analysis (GC/MS): Samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (Volatile Organic Compounds by Isotope Dilution Gas Chromatography—Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported in project specific reporting units. Samples were reported as mg/L.

- * None

G001-002.23.CH_041121.doc



G001-002.23.CH_041121.doc



G001-002.23.CH_041121.doc



ANN ARBOR TECHNICAL SERVICES, INC. QUALITY ASSURANCE / QUALITY CONTROL SUMMARY LABORATORY BLANK SUMMARY

Laboratory Fortified Blank (LB/R) / Method Blank (MB)											
Lab Sample ID	Location	Project Name	Sample Type	Sample ID	Sample Date	Sample Volume	Sample Weight	Sample Density	Sample Temperature	Sample pH	Sample Color
USAFA 1024	GC/OC/Blank Number: G001-002.23.1	Project Number: 6412121	Sample Type: Blank	Sample ID: G001-002.23.1	Sample Date: 4/25/2022	Sample Volume: 1.00 mL	Sample Weight: 0.00 g	Sample Density: 1.00 g/mL	Sample Temperature: 20.0 °C	Sample pH: 7.0	Sample Color: Clear

ANN ARBOR TECHNICAL SERVICES, INC. QUALITY ASSURANCE / QUALITY CONTROL SUMMARY LABORATORY ACCURACY SUMMARY

Matrix Spike (MS)											
Lab Sample ID	Location	Project Name	Sample Type	Sample ID	Sample Date	Sample Volume	Sample Weight	Sample Density	Sample Temperature	Sample pH	Sample Color
USAFA 1024	GC/OC/Blank Number: G001-002.23.1	Project Number: 6412121	Sample Type: Blank	Sample ID: G001-002.23.1	Sample Date: 4/25/2022	Sample Volume: 1.00 mL	Sample Weight: 0.00 g	Sample Density: 1.00 g/mL	Sample Temperature: 20.0 °C	Sample pH: 7.0	Sample Color: Clear

ANN ARBOR TECHNICAL SERVICES, INC. QUALITY ASSURANCE / QUALITY CONTROL SUMMARY LABORATORY ACCURACY SUMMARY

Matrix Spike Duplicate (MSD)											
Lab Sample ID	Location	Project Name	Sample Type	Sample ID	Sample Date	Sample Volume	Sample Weight	Sample Density	Sample Temperature	Sample pH	Sample Color
USAFA 1024	GC/OC/Blank Number: G001-002.23.1	Project Number: 6412121	Sample Type: Blank	Sample ID: G001-002.23.1	Sample Date: 4/25/2022	Sample Volume: 1.00 mL	Sample Weight: 0.00 g	Sample Density: 1.00 g/mL	Sample Temperature: 20.0 °C	Sample pH: 7.0	Sample Color: Clear

CHAIN OF CUSTODY RECORD

Date Received	Date Analyzed	Analyst	Sample Description		Comments
			Sample ID	Sample Name	
4/25/2022	4/25/2022	Mark DeLong	G001-002.23.1	Laboratory Fortified Blank (LB/R) / Method Blank (MB)	
4/25/2022	4/25/2022	Philip Simon	G001-002.23.1	Laboratory Fortified Blank (LB/R) / Method Blank (MB)	
4/25/2022	4/25/2022	Mark DeLong	G001-002.23.1	Matrix Spike (MS)	
4/25/2022	4/25/2022	Philip Simon	G001-002.23.1	Matrix Spike (MS)	
4/25/2022	4/25/2022	Mark DeLong	G001-002.23.1	Matrix Spike Duplicate (MSD)	
4/25/2022	4/25/2022	Philip Simon	G001-002.23.1	Matrix Spike Duplicate (MSD)	

* Requested Turn Around Time Priority Number Key: 1 = Urgent, 2 = Rush, 3 = Standard



1,4-Dioxane by GC/MS
Data Summary Sheet

Test Number	G001-002-22	Percent Mixture	100.0
Instrument	GC/MS	Subsample (mL)	0.000
Sample ID	0410221	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Date	04/10/2022 10:10	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Number	GQ001-002-22	Analysis Date	04/10/2022 11:17:13

1,4-Dioxane by GC/MS
Data Summary Sheet

ATB Project Number	G001-002-22	Percent Mixture	100.0
ATB SDS Number	0410221	Instrument	GC/MS
Client Sample ID	Red Pond	Subsample (mL)	0.000
Sample ID	0410221-2	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Sample Date	04/10/2022 10:05	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Batch Number	GQ001-002-22	Analysis Date	04/10/2022 13:00:00

1,4-Dioxane by GC/MS
Data Summary Sheet

ATB Project Number	G001-002-22	Percent Mixture	100.0
ATB SDS Number	0410221	Instrument	GC/MS
Client Sample ID	LH-4	Subsample (mL)	0.000
Sample ID	0410221-4	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Sample Date	04/10/2022 10:05	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Batch Number	GQ001-002-22	Analysis Date	04/10/2022 14:58:42

1,4-Dioxane by GC/MS
Data Summary Sheet

ATB Project Number	G001-002-22	Percent Mixture	100.0
ATB SDS Number	0410221	Instrument	GC/MS
Client Sample ID	TW-23	Subsample (mL)	5.000
Sample ID	0410221-6	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Sample Date	04/10/2022 10:10	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Batch Number	GQ001-002-22	Analysis Date	04/10/2022 15:40:37

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

1,4-Dioxane by GC/MS
Data Summary Sheet

Test Number	G001-002-22	Percent Mixture	100.0
Instrument	GC/MS	Subsample (mL)	0.000
Sample ID	TW-29	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Date	04/10/2024 10:10	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Number	GQ001-002-22	Analysis Date	04/10/2022 07:39:26

1,4-Dioxane by GC/MS
Data Summary Sheet

ATB Project Number	G001-002-22	Percent Mixture	100.0
ATB SDS Number	0410221	Instrument	GC/MS
Client Sample ID	TW-21	Subsample (mL)	0.000
Laboratory Sample ID	0410221-7	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Sample Date	04/10/2022 10:05	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Batch Number	GQ001-002-22	Analysis Date	04/10/2022 17:08:14

1,4-Dioxane by GC/MS
Data Summary Sheet

ATB Project Number	G001-002-22	Percent Mixture	100.0
ATB SDS Number	0410221	Instrument	GC/MS
Client Sample ID	TW-18	Subsample (mL)	0.000
Sample ID	0410221-8	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Sample Date	04/10/2022 10:35	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Batch Number	GQ001-002-22	Analysis Date	04/10/2022 17:52:11

1,4-Dioxane by GC/MS
Data Summary Sheet

ATB Project Number	G001-002-22	Percent Mixture	100.0
ATB SDS Number	0410221	Instrument	GC/MS
Client Sample ID	TW-10	Subsample (mL)	5.000
Sample ID	0410221-0	Final Volume (mL)	5.000
Matrix	Oil	Dilution Factor	10
Sample Date	04/10/2022 11:43	Basis	Wet
Analytical Method (USEPA)	USEPA 1624	Units	mg/L
Preparation Method (USEPA)	USEPA 1624	Preparation Date	04/10/2022
QC Batch Number	GQ001-002-22	Analysis Date	04/10/2022 18:20:09

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

Ann Arbor Technical Services, Inc.
295 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3721

1,4-Dioxane by GC/MS Data Summary Sheet	
Percent Moisture	100.0
Instrument	21000
Subsample (mL)	5.000
Final Volume (mL)	3.000
Dilution Factor	5
Date	Wed
Unit	mg/L
Preparation Date	04/10/2002
Sample ID	1,4-dioxane

1,4-Dioxane by GC/MS	
Data Summary Sheet	
22	Percent Moisture
	Instrument
	Substrate Name (mL)
11	Substrate Volume (mL)
2 12:00	Dilution Factor
124	Stale
124	Used
124	Apparatus Date
	Sample Date

1,4-Dioxane by GC/MS Data Summary Sheet	
Percent Maturation	100.0
Instrument	1040V
Column Name	DB-1701
Initial Volume (mL)	3.000
Dilution Factor	1000
Baseline	Wbd
Sample ID	1001
Analysis Date	2/10/2022 09:26:16
Replicate Series	1001

1,4-Dioxane by GC/MS Data Summary Sheet	
Percent Measure	100.0
Instrument	2100D
Sample (ml)	0.000
Final Volume (ml)	0.000
Dilution Factor	10
Date	Wet
Preparation Date	04/10/2022
Analysis Date	04/07/2022 01:12:00

which reference US EPA methods unless otherwise noted.
Values (transformed prior to modeling)
of species reporting limit (URL) based upon known calibration provided.
Indicates elevated reporting limit based upon sample dilution.

All methods mentioned (22-27), including primary difference method,
Cumulative performance prior to reporting
Percent specific reporting level (MSL) based upon former cumulative
M = number informed / reporting limit tested (with sample efficient).

Administrative enforcement: USEPA methods to assess administrative action.
Calculations performed: Prior to rounding.
Present specific reporting test (NCE): based upon revised administrative standard
SI = indicates estimated reporting test-based upon example (other).

All methods reference US EPA methods unless otherwise noted.
Calibration performed prior to monitoring.
Percent specific reporting limit (SPL) based upper bound calibration standard.
All - indicates element reporting limit based on sample detection limit.

Ann Arbor Technical Services, Inc.
10 South Wagner Road
Ann Arbor, Michigan 48103

Office: 734-995-0995
Fax: 734-995-3731

Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, Michigan 48103

Officer 734-000-0
Fax 734-000-3

Office: 734-985-0005
Fax: 734-985-3731

Office: 734-915-0255
Fax: 734-915-3731

1,4-Dioxane by GC/MS Data Summary Sheet	
Percent Moisture	100.0
Instrument	7100V
Bitsample (mL)	0.0005
Final Volume (mL)	0.0005
Dilution Factor:	1
Beats	Wet
Units	mg/L
Preparation Date	G412/2021/22
Analysis Date	G412/2021/22 05:49:00

1,4-Dioxane by GC/MS Data Summary Sheet	
	Percent Moisture
	Instrument
	Subsample (mL)
	Shut Volume (mL)
	Dilution Factor
	Basic
	Units
	Preparation Date
	Analytical Date
100.0	±10.0%
5.000	±0.0005
2.000	±0.0002
10	Wt/Wt
mg/g	mg/mL
10/05/02	10/05/02
1624	1624
08410221	08410221

1,4-Dioxane by GC/MS Data Summary Sheet	
102.22	Precise Molality
15	Instrument
4	BulkSample (mL)
11-18	Final Volume (mL)
	Dilution Factor
0222 12/20	Batch
1624	Units
1624	Preparation Date
DMH16221	Analyte Data

1,4-Dioxane by GC/MS Data Summary Sheet	
02/22	100.0
1	1500
1e	1000
1t-1b	1000
First Sample (mL)	mL
Dilution Factor	1
Basis	Weight
Units	mg/L
Preparation Date	1/22/2022
Analyte Date	1/22/2022
	1/22/2022 04:08:55

Comments: *Indicates reference 10% EPA methods unless otherwise noted.*
Speciation preferred per 40 HSWL.
Specific monitoring limit (SML) based upon lowest calibration standard.

Comments
All methods reference U.S. EPA methods unless otherwise noted.
Cassellino performed prior to modeling.
Report specifies reporting limit (MUL) based upon benzene calibration
at 4.4 micrograms/diluted sample. Total benzene sum sample (three

Comments:
All methods reference 125 UPA methods unless otherwise noted.
Calibration performed prior to monitoring.
Plated species reporting limit (MLL) based upon Sample culture for some
ML = Infectious amoebae reporting limit based upon sample dilution.

Comments _____
All methods reference 170 U.S. methods unless otherwise noted.
Cultivation, sterilized prior to inoculating.
Plates spotted, reporting limit (MLL) based upon standard culture media.
M - indicates specimen reported as being taken upon clinical discharge.

Ann Arbor Technical Services, Inc.
300 South Weather Road

Office: 734-990-0800
Fax: 734-815-3775

Ann Arbor Technical Services,
260 South Wagner Road

Office: 734-800
Fax: 734-805

Office: 734-885-8065
Fax: 734-885-3731

Other: 734-0988-0988
Fax: 734-0925-3725

1,4-Dioxane by GC/MS
Data Summary Sheet

Sample Number	G001-002-22
Instrument	100.0
Subsample (mL)	5.000
Final Volume (mL)	5.000
Dilution Factor	1
Matrix	Water
Sample Date	04/19/2022 12:56
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 04:00:34

CASE	Result	MDL	PQL	Qual
123-01-1	0.002	0.001		

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	G001-002-22
ATS SDS Number	SD001
Client Sample ID	MW-1704
Laboratory Sample ID	SD11021-05
Matrix	Water
Sample Date	04/19/2022 12:56
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 05:34:09

CASE	Result	MDL	PQL	Qual
123-01-1	ND	0.001		U

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	G001-002-22
ATS SDS Number	SD001
Client Sample ID	MW-1704
Laboratory Sample ID	SD11021-21
Matrix	Water
Sample Date	04/19/2022 14:15
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 06:17:44

CASE	Result	MDL	PQL	Qual
123-01-1	ND	0.001		U

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

1,4-Dioxane by GC/MS
Data Summary Sheet

ATS Project Number	G001-002-22
ATS SDS Number	SD001
Client Sample ID	SD11021-05
Laboratory Sample ID	SD11021-1
Matrix	Water
Sample Date	04/19/2022 17:00
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 06:16:49

CASE	Result	MDL	PQL	Qual
123-01-1	ND	0.001		U

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Sample Number	G001-002-22
Instrument	100.0
Subsample (mL)	5.000
Final Volume (mL)	5.000
Dilution Factor	1
Matrix	Water
Sample Date	04/20/2022 09:49
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 21:03:49

CASE	Result	MDL	PQL	Qual
123-01-1	0.49	0.04		M

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

ATS Project Number	G001-002-22
ATS SDS Number	SD001
Client Sample ID	MW-1704
Laboratory Sample ID	SD12021-05
Matrix	Water
Sample Date	04/20/2022 12:56
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 20:03:44

CASE	Result	MDL	PQL	Qual
123-01-1	ND	0.001		M

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

ATS Project Number	G001-002-22
ATS SDS Number	SD001
Client Sample ID	MW-1704
Laboratory Sample ID	SD12021-2
Matrix	Water
Sample Date	04/20/2022 14:15
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 20:48:32

CASE	Result	MDL	PQL	Qual
123-01-1	ND	0.001		M

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

ATS Project Number	G001-002-22
ATS SDS Number	SD001
Client Sample ID	SD12021-05
Laboratory Sample ID	SD12021-05
Matrix	Water
Sample Date	04/20/2022 17:00
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
GC Batch Number	GCG001-002-21
Analysis Date	04/23/2022 21:30:18

CASE	Result	MDL	PQL	Qual
123-01-1	ND	0.001		M

Comments:
 All methods performed 10-12% relative standard deviation.
 Calculations performed prior to reporting.
 Detection performance prior to reporting.
 Quantitation performance prior to reporting.
 M - indicates method reporting limit based upon sample dilution.

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731

Ann Arbor Technical Services, Inc.
200 South Wagner Road
Ann Arbor, Michigan 48103

Offer: 734-695-0995
Fax: 734-695-3731



A Disease Comment

Call No. 734.005.0001

Ann Arbor Technical Services, Inc.
2903 South Wagner Road
Ann Arbor, Michigan 48103

Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Org_SRF_0425221
Client PO Number: 4505179649
Project Description: This data report contains the results of 3 water samples, received by ATS on April 25, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and are compliant with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratory, as required by USEPA. Laboratory data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel Email: gage_trendel@pall.com
FAX Number:

No. of Pages (including cover pg.): 16

From: Sarah Stuhlefeldt Email: sarah_stuhlefeldt@annarbortechnicalservices.com
Sarah Chacon (Lab Manager) FAX Number: 734-995-3731

Additional Message: Copy report to: Pallaron, Keith (keith.pallaron@pall.com), Brode, Jim (jim.brode@pall.com)
Katie Stuhlefeldt (katie.stuhlefeldt@pall.com), rwoots@tv-operations.com, Peters, Sue Peters (sue_peters@pall.com)
Amanda Isabell (amanda_isabell@pall.com)

Date: 5/2/22 Signed: 

ORGANIC ANALYSIS
1,4-Dioxane by GC/MS
USEPA 1624

LABORATORY OPERATIONS
CASE NARRATIVE

ATS Project Number: G001-002
Report Date: 5/2/22
SRF / SDG Number(s): 0425221
Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 3 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 4/25/22, and associated matrix-specific QA/QC:

Sample	Client Sample Identification	Sample Date	Reanalysis Turn Around Time	Analysis	Metric
Received	4/25/22				
QTR01001	4/24/22	Urgent	1d/24hr	Water	
MW-BE-1a	4/25/22	Standard	1d/24hr	Water	
MW-BE-1a	4/27/22	Standard	1d/24hr	Water	

Upon receipt samples were scheduled for the following analysis.

- | | |
|---|--|
| Analysis | Number of Samples |
| • 1,4-Dioxane (USEPA 1624) – Urgent TAT | • 1 Sample + 1 Matrix Spike + 1 Matrix Spike Duplicate |
| • 1,4-Dioxane (USEPA 1624) – Standard TAT | • 2 Samples |

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, are either present in the "Sample Receipt" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 45 days of the following exception:

* None

G001-002.CN_5401221.xls
Consultants in Chemistry & Environmental Science
290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/995-3995 Fax 734/995-3731

Data Review and Approval

All data contained in this report have been presented in accordance with guidelines provided in the referenced standards and method, and are compliant with detailed procedures described in a written standard operating procedure specific to the laboratory. This report is subject to review and approval by management prior to issuance. Any changes made to the data or report must be documented and approved by management prior to issuance. This report is subject to review and approval by management prior to issuance. Any changes made to the data or report must be documented and approved by management prior to issuance.

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LR1), fortified blanks (LR1, LR2, LCS), matrix spikes (MS, SPK), and duplicates whether spiked or native (MD, SPK, DUF, DU, LR).

Data Qualifications, Specifications, and Technical Narration

The following are qualitative descriptions that may be used throughout this SDG and are presented with their associated samples in each SDG section as appropriate.

- * "D" – exceeds the calibration range of the method
- * "S" – result taken from sample dilution
- * "LR" – limit of detection (LOD), and the Practical Quantitation Limit (PQL)/Limit Of Quantitation (LOQ)
- * "MDL" – concentration reported below the laboratory instrument Method Detection Limit (MDL)/Limit Of Quantitation (LOQ) and the instrument Signal To Noise Ratio (SNR) of approximately 10:1
- * "PQL" – analytical detection limit in method blanks, exceeds reporting limit
- * "T" – analyte not detected in method blank
- * "++" – indicates analysis has exceeded batch or sample specific QA/QC control limits
- * "M" – indicates matrix interference
- * "R" – result taken from sample dilution and K factor acceptance window
- * "NR" – result taken from sample dilution and K factor acceptance window and result is Not Reported

A single QA/QC batch is defined as no more than 20 samples excluding method blanks (MB, LR1), fortified blanks (LR1, LR2, LCS), matrix spikes (LFN, MS, SPK), and duplicates whether spiked or native (LFMD, MSD, SPK, DUF, DUR, LR).

Data Deliverables

This data package constitutes a Level II package; other data report packages (Level I, Level IV DVP, EPA R5 ED0) are available upon request. There were no hardcopy data summary sheets generated for this project.

Sample Analysis

1,4-Dioxane Analysis (GC/MS) – samples were analyzed by purge and trap GC/MS in accordance with USEPA method 1624 (1,4-Dioxane Organic Compounds by Isotope Dilution Gas Chromatography – Mass Spectrometry). An initial calibration with at least five levels was used to quantitate 1,4-Dioxane. Samples were reported to project specific reporting limits. Samples were reported as ng/L.

Anomalous Notes:

- * None

G001-002.CN_5401221.xls



Prepared By:
Ann Arbor Technical Services, Inc.
290 South Wagner Road
Ann Arbor, MI 48103

Sample Dilution

This material is intended only for the use of the individual or entity to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the proper representative for delivering the material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

G001-002.CN_5401221.xls_Tranmittal_Cover_Page.GLSa

PRECISION

Matrix Spike and Matrix Spike Duplicates - Precision

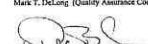
A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the precision acceptance criteria with the following exceptions:

- * None


Mark DeLong

/ Mar 2, 2022

Mark T. DeLong (Quality Assurance Coordinator)


Philip D. Simon (Laboratory Director)

/ Mar 2, 2022

Laboratory Reagent Blanks

A laboratory reagent blank (LRB) was analyzed as part of the QA/QC batch. The LRB met the acceptance criteria with the following exception:

- * None

Internal Standards and Surrogates - Quantitation

This method utilizes Internal Standards only, not Surrogates. Internal standards areas and retention times met the acceptance criteria with the following exceptions:

- * None

ACCURACY

Laboratory Fortified Blanks (LF/B/OPR) Laboratory Control Samples - Accuracy

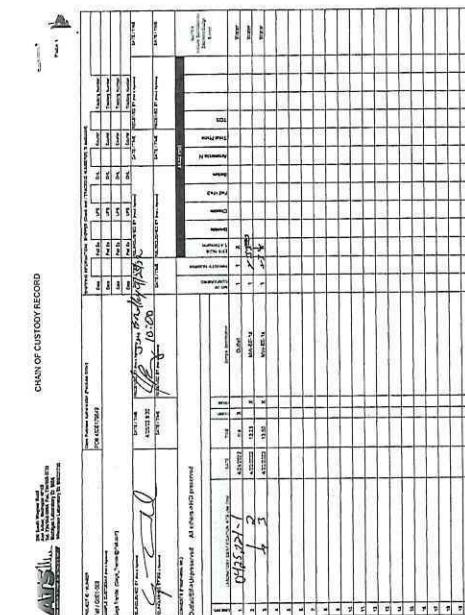
A laboratory fortified blank (LF/B/OPR) was analyzed as part of the QA/QC batch. The LF/B/OPR met the acceptance criteria with the following exception:

- * None

Matrix Spikes and Matrix Spike Duplicates - Accuracy

A matrix spike (MS) and matrix spike duplicate (MSD) was analyzed as part of the QA/QC batch. The MS/MSD's met the accuracy acceptance criteria with the following exception:

- * None



* Requested Turn Around Time Priority Number Ref: 1 = Urgent 2 = Rush 3 = Standard

Jill

ey

Front: Trendel_Gage_trendel@pall.com
Monday, April 25, 2022 2:21 PM
To: [Jill.ey@pall.com](mailto:jill.ey@pall.com)
Subject: RE: eCOC 4/25/2022

Type: My mistake. The two monitoring wells sent today are standard turnaround.

The high result was not expected. If the result comes back high on the rerun, we'll have to live with that result.

Gage Trendel

Chemist

PAY DIFFERENT FRACTION AND INTEGRITY MANAGEMENT, INC.
642 S. Wagner Road | Ann Arbor | MI 48103
O: 616.977.1000 | D: 419.751.5144 | F: 616.977.1005

From: Jim Bradley <jim.bradley@annarbortechnicalservices.com>
Sent: Monday, April 25, 2022 2:48 PM
To: Trendel, Gage <gage_trendel@pall.com>
Subject: RE: eCOC 4/25/2022

This Message Is From an External Sender

This message came from outside your organization. Use caution when opening.

Gage

I have a couple of questions for you.

You indicated urgent turn for MW-BE-1a and MW-BE-1a is that fine?
And my records indicate that MW-BE-1a should be around 50ppb. I had an initial result of around 500ppb. I am currently running another dilution, is this something we could expect?

Thanks Jim

From: Trendel, Gage <gage_trendel@pall.com>
Sent: Monday, April 25, 2022 8:55 AM
To: Sarah Stuhlefeldt <sarah_stuhlefeldt@annarbortechnicalservices.com>; Mark DeLong <Mark.DeLong@annarbortechnicalservices.com>; David Stuhlefeldt <David.Stuhlefeldt@annarbortechnicalservices.com>; Jim Bradley <jim.bradley@annarbortechnicalservices.com>
Subject: Pall eCOC 4/25/2022

Gage Trendel
Chemist

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY PRECISION SUMMARY

USEPA 1624 QAOQC Batch Number: G001-00221 SDG: 0428222 Project Number: 001-0022 Report Date: 5/2/2022									
Matrix Spike (HS) Matrix Spike Duplicate (HS)									
Sample ID	Instrument Name	Conc. (ppm)	Actual Conc. (ppm)	Recovery (%)	SD (%)	Mean	Max	Min	Conc. Unit
ATSP-14221	GC/MS	100.0	100.0	100.0	0.0	100.0	100.0	100.0	ppm
ATSP-14222	GC/MS	100.0	100.0	100.0	0.0	100.0	100.0	100.0	ppm
ATSP-14223	GC/MS	100.0	100.0	100.0	0.0	100.0	100.0	100.0	ppm

Sample ID: ATSP-14221, Sample Name: USEPA 1624, Sample Type: QAOQC, Sample Description: Matrix Spike (HS) Matrix Spike Duplicate (HS), Sample Preparation: None, Sample Volume: 100.000000 mL, Sample Temperature: 20.000000 °C, Sample pH: 7.000000, Sample Density: 1.000000 g/mL, Sample Viscosity: 0.000000 cP, Sample Color: Clear, Sample Odor: None, Sample Notes: None, Sample Status: Received, Sample Received Date: 5/2/2022, Sample Due Date: 5/2/2022, Sample Last Update Date: 5/2/2022, Sample Last Update User: [Signature]

500 South Wagner Road
Ann Arbor, Michigan 48103
Midwest Laboratory 401-7948-1730

Data Transmittal Cover Page

Project Name: Pall Corporation
ATS Project Number: G001-002
ATS Report Number(s): Org_SRF_0428221
Client PO Number: 4505179640

Project Description: This data report contains the results of 5 water samples, received by ATS on April 25, 2022 to be analyzed for 1,4-Dioxane.

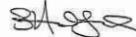
We certify that the sample analysis for this report have been conducted in accordance with guidelines provided in the referenced standard test method, and in compliance with laboratory quality control described in our Standard Operating Procedure. The Laboratory is equipped by USEPA Laboratory data sheets, USEPA, and QAOQC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Greg Trendel Email: greg_trendel@pall.com
FAX Number: _____

No. of Pages (including cover pg.): 17

From: Sarah Shabbeld Email: Sarah.Shabbeld@AnnArborTechnicalServices.com
Fax Number: 734-695-3731

Additional Message: Copy report to: Palman, Keith health_keith@pall.com; Briske, Jim jbriske@pall.com; Koko Dzidzokwetseko_koko@pall.com; Headings@opsmatters.com; Peters, Sue Peters sue_peters@pall.com; Amanda Isobelli amanda_isobelli@pall.com

Date: 5/2/22 Signed: 

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-695-0995.

This material is intended only for the use of the individual or entity to whom it is addressed, and may contain information (but is privileged and confidential). If you are not the intended recipient or the agent responsible for delivering the material to the intended recipient, you are hereby notified that any disclosure, distribution, copying or use of the communication is strictly prohibited. If you have received the communication in error, please notify us immediately by telephone. Thank you.

X0001-002-22Data_Transmittal_CoverPage.xls

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Laboratory Certified Blank (LFB) Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPRA)									
Method: USEPA 1624					QAOQC Batch Number: G001-00221				
SDG: 0428222					Project Number: 001-0022				
Report Date: 5/2/2022					Report Due: 5/2/2022				
Laboratory: Laboratory Block (LBB) Method Block (MB)	Instrument: Agilent 7000 Series	Conc. (ppm)	Actual Conc. (ppm)	Recovery (%)	SD (%)	Mean	Max	Min	Conc. Unit
Lab Sample ID: 0428221	SDG 14221	123.51	123.51	100.0	0.0	123.51	123.51	123.51	ppm

Sample ID: 0428221, Sample Name: USEPA 1624, Sample Type: LFB, Sample Description: Laboratory Certified Blank (LFB) Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPRA), Sample Preparation: None, Sample Volume: 100.000000 mL, Sample Temperature: 20.000000 °C, Sample pH: 7.000000, Sample Density: 1.000000 g/mL, Sample Viscosity: 0.000000 cP, Sample Color: Clear, Sample Odor: None, Sample Notes: None, Sample Status: Received, Sample Received Date: 5/2/2022, Sample Due Date: 5/2/2022, Sample Last Update Date: 5/2/2022, Sample Last Update User: [Signature]

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Matrix Spike Duplicate (MSD)									
Method: USEPA 1624					QAOQC Batch Number: G001-00221				
SDG: 0428222					Project Number: 001-0022				
Report Date: 5/2/2022					Report Due: 5/2/2022				
Laboratory: Laboratory Block (LBB) Method Block (MB)	Instrument: Agilent 7000 Series	Conc. (ppm)	Actual Conc. (ppm)	Recovery (%)	SD (%)	Mean	Max	Min	Conc. Unit
Lab Sample ID: 0428221	SDG 14221	123.51	123.51	100.0	0.0	123.51	123.51	123.51	ppm

Sample ID: 0428221, Sample Name: USEPA 1624, Sample Type: MSD, Sample Description: Matrix Spike Duplicate (MSD), Sample Preparation: None, Sample Volume: 100.000000 mL, Sample Temperature: 20.000000 °C, Sample pH: 7.000000, Sample Density: 1.000000 g/mL, Sample Viscosity: 0.000000 cP, Sample Color: Clear, Sample Odor: None, Sample Notes: None, Sample Status: Received, Sample Received Date: 5/2/2022, Sample Due Date: 5/2/2022, Sample Last Update Date: 5/2/2022, Sample Last Update User: [Signature]

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Matrix Spike Duplicate (MSD)									
Method: USEPA 1624					QAOQC Batch Number: G001-00221				
SDG: 0428222					Project Number: 001-0022				
Report Date: 5/2/2022					Report Due: 5/2/2022				
Laboratory: Laboratory Block (LBB) Method Block (MB)	Instrument: Agilent 7000 Series	Conc. (ppm)	Actual Conc. (ppm)	Recovery (%)	SD (%)	Mean	Max	Min	Conc. Unit
Lab Sample ID: 0428221	SDG 14221	123.51	123.51	100.0	0.0	123.51	123.51	123.51	ppm

Sample ID: 0428221, Sample Name: USEPA 1624, Sample Type: MSD, Sample Description: Matrix Spike Duplicate (MSD), Sample Preparation: None, Sample Volume: 100.000000 mL, Sample Temperature: 20.000000 °C, Sample pH: 7.000000, Sample Density: 1.000000 g/mL, Sample Viscosity: 0.000000 cP, Sample Color: Clear, Sample Odor: None, Sample Notes: None, Sample Status: Received, Sample Received Date: 5/2/2022, Sample Due Date: 5/2/2022, Sample Last Update Date: 5/2/2022, Sample Last Update User: [Signature]



ANN ARBOR TECHNICAL SERVICES, INC.
LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-0022
Report Date: 5/2/22
SRF / SDG Number(s): 0428221
Client PO Number: 4505179649

Case Narrative Summary

This case narrative applies to the following 5 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 4/28/22, and associated matrix-specific QA/QC:

Samples					
Client Sample Identification	Sample Date	Required Turn Around Time	Analysis	Matrix	Notes
Revised 4/28/22	4/28/22	Urgent	1-Matrix Spike	Water	
Original 4/22	4/28/22	Urgent	1-Matrix Spike	Water	
1st QC 1a	4/28/22	Urgent	1-Matrix Spike	Water	
1st QC 1b	4/28/22	Urgent	1-Matrix Spike	Water	
1st QC 2a	4/28/22	Urgent	1-Matrix Spike	Water	
1st QC 2b	4/28/22	Urgent	1-Matrix Spike	Water	

Upon receipt samples were scheduled for the following analyses:

Analyses	Number of Samples
1-L,Dioxane (USEPA 1624) - Urgent TAT	5 Samples + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with paper chain of custody records included. Sample condition and anomalies, if any, are either presented in the "Sample Results" section of this report or in the comments on individual data sheets. All samples were prepared and analyzed within 48 days unless the following exceptions:

None

G001-002-22Data_Transmittal_CoverPage.xls

Consultant in Chemistry of Environmental Science
200 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/995-0995 Fax 734/995-3731

**QUALITY ASSURANCE / QUALITY CONTROL SUMMARY
LABORATORY BLANK SUMMARY**

Method	MEPA 1624
Sample Batch Number	041020220322
SDS	
Project Number:	G001-0022
Report Date	5/23/2022

Laboratory Reagent Blank (LRB) / Method Blank (MB)						
Lot/Expt No	Analyte	Date Analyzed	Chemical Name	CAS	Result	Units

Comments
All methods reference 1.0 GFA methods unless otherwise noted.
Calculations performed prior to rounding.
Project results reporting limit (MDL) based upon three detection percent.



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

Ecosystems
All habitats where US EPA monitors water effluent load
Cumulative sufficient time or volume

Interspersing penicillin at concentrations above the initial calibration were then diluted and readyyed into test compartments. The following samples were diluted at a 4 \times dilution:

- Rat blood (1/222)



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY									
Vehid	USP/ICU								
CAQO Batch Number:	05/05/2022								
442521									
Report Number:	053-002-22								
Report Date:	5/2/2022								
Matrix Spike (US)									
#	Test Name	Sample Type	Sample Name	Chemical Name	.....	.....	.....	.....	.....
					.....	Spike	Measured	Percent	Units

Comments _____
If not false, whence US EPA methods unique otherwise listed.

Mirr/Silic and Mirr/Silic Distillate - Variation
A water only (MS) and water only (MSE) was assigned as part of the QMOC batch. The MSE
was the process acceptance criteria with the following exception:
• None



ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

**QUALITY ASSURANCE & QUALITY CONTROL SUMMARY
LABORATORY ACCURACY SUMMARY**

Lab Sample ID	Analytical Date	Analytical Time	Chemical Name
4282212-M03	04/26/2022	16:18:55	E,A-Dioxane

200 South, Regional Building
4th Floor, Worcester, MA 01655
(508) 851-2200, Fax: (508) 851-2201

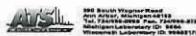
QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY PRECISION SUMMARY

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

Method	USEPA 1624
QOC/C Batch Number:	QOC/C-0042021
QOC/C Date:	04/20/2021
Project Number:	000-0022
Report Date:	05/22/2021
Laboratory Project Block (LFB) Laboratory Blank (LB)	5.0±0.23
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	1.0±0.00%
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	0.0±0.00%

Method	USEPA 1624
QOC/C Batch Number:	QOC/C-0042021
QOC/C Date:	04/20/2021
Project Number:	000-0022
Report Date:	05/22/2021
Laboratory Project Block (LFB) Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPA)	5.0±0.23
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	1.0±0.00%
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	0.0±0.00%



Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Ong_SRP_0502221
 Client PO Number: 4585179649

Project Description: This data report contains the results of 6 water samples, received by ATS on May 02, 2022 to be analyzed for 1,4-Dioxane.

We certify that the sample analyses for this report have been conducted in accordance with guidelines provided in the Analytical Method Test Procedure, and in accordance with quality assurance measures set forth in a written Quality Operating Procedure, and the ATS Laboratory, as well as USEPA, Laboratory Data sheets, SOPs, and QA/QC information are available for inspection and audit at the laboratory upon request. Unless specifically noted on the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Gage Trendel Email: gage_trendel@trul.com
 FAX Number: _____

No. of Pages (including cover pg.): 18

From: Sarah Shabbiloff Email: Sarah.Shabbiloff@AnnArborTechnicalServices.com
 Senior Chemist / Lab Manager FAX Number: 734-695-3731

Additional Message: Copy report to: Patterson, Keith (mailto:patterson@pall.com), Brode, Jim (mailto:brode@pall.com)
 Kufe Shabouer (mailto:kufe@pall.com), hettmiller@expresschem.com, Palusz, Lisa (mailto:lisa.palusz@pall.com)
 Amanda Isabella (mailto:amanda_isabella@pall.com)

Date: 5/22/22 Signed:

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-895-0905.

This material is intended only for the use of the individual to whom it is addressed, and may contain information that is privileged and confidential. If you are not the intended recipient or the agent responsible for delivering this material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of the communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

X5001-002-222DateTransmittal_Cover_Page.cs

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method	USEPA 1624
QOC/C Batch Number:	QOC/C-0042021
QOC/C Date:	04/20/2021
Project Number:	000-0022
Report Date:	05/22/2021
Laboratory Project Block (LFB) Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPA)	5.0±0.23
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	1.0±0.00%
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	0.0±0.00%

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method	USEPA 1624
QOC/C Batch Number:	QOC/C-0042021
QOC/C Date:	04/20/2021
Project Number:	000-0022
Report Date:	05/22/2021
Laboratory Project Block (LFB) Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPA)	5.0±0.23
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	1.0±0.00%
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	0.0±0.00%

ANN ARBOR TECHNICAL SERVICES, INC.

QUALITY ASSURANCE / QUALITY CONTROL SUMMARY

LABORATORY ACCURACY SUMMARY

Method	USEPA 1624
QOC/C Batch Number:	QOC/C-0042021
QOC/C Date:	04/20/2021
Project Number:	000-0022
Report Date:	05/22/2021
Laboratory Project Block (LFB) Laboratory Control Sample (LCS) / On-Going Precision and Accuracy (OPA)	5.0±0.23
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	1.0±0.00%
Lab Sample ID: LabSampleID: 44592333 Date/Time: 04/21/21 14:37:41	0.0±0.00%



LABORATORY OPERATIONS CASE NARRATIVE

ATS Project Number: G001-002
 Report Date: 5/9/22
 SRV / SDG Number(s): 0502221
 Client PO Number: 4585179649

Case Narrative Summary

This case narrative applies to the following 6 samples that were received at Ann Arbor Technical Services, Inc. (ATS) on 5/9/22, and associated matrix-specific QA/QC.

Samples					
Client Sample Identification	Sample Date	Required Turn Around Time	Analyst	Matrix	Notes
Recover 002	5/1/22	1-4-Dioxane	Water	Water	
Outfall 001	5/1/22	1-4-Dioxane	Water	Water	
Red Pond	5/1/22	1-4-Dioxane	Water	Water	
1-4-Dioxane	5/1/22	1-4-Dioxane	Water	Water	
1-4-Dioxane	5/1/22	1-4-Dioxane	Water	Water	
Outfall 002	5/1/22	1-4-Dioxane	Water	Water	
TW-24	4/29/22	Standard	1-4-Dioxane	Water	

Upon receipt sample were scheduled for the following analysis.

- 1-4-Dioxane (USEPA 1624 - Urgent TAT)
- 1-4-Dioxane (USEPA 1624 - Standard TAT)
- 1 Sample + 1 Matrix Spike + 1 Matrix Spike Duplicate

Sample Receipt, Chain of Custody Records, and Holding Times

Samples were delivered directly to ATS by Pall Corporation staff. Samples were received with proper chain of custody records included. Sample condition and anomalies, if any, were either presented in the "Sample Receipt" section of this report or on individual data sheets. All samples were prepared and analyzed within 45 days with the following exception:

- None

G001-002-222DateTransmittal_Cover_Page.cs

Consultant in Chemistry, Environmental Science
 290 South Wagner Road, Ann Arbor, Michigan 48103 Tel 734/695-2995 Fax 734/695-3731

Data Transmittal Cover Page

Project Name: Pall Corporation
 ATS Project Number: G001-002
 ATS Report Number(s): Org_SRF_0503221
 Client PO Number: 4505179649

Project Description: This data report contains the results of 6 water samples, received by ATS on May 03, 2022 to be analyzed for 1,4 Dioxane.

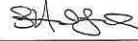
We certify that the sample analysis results in this report have been conducted in accordance with guidelines provided in the laboratory standard test method, and are consistent with detailed procedures described in a written Standard Operating Procedure specific to the ATS Laboratories, as required by USEPA. Laboratory data sheets, QMPC, and QAQC information are available for inspection and audit at the laboratory upon request. Unless specifically noted in the data report, all applicable sample preservation and holding time requirements have been met.

Recipient: Mr. Craig Trindell Email: capp.mtindell@att.com
 FAX Number:

No. of Pages (including cover pg.): 18

From: Sarah Gribblefield Email: Sarah.Gribblefield@AnnArborTechnicalServices.com
 Senior Chemist/Lab Manager FAX Number: 734-665-3731

Additional Message: Copy report to: Patterson, Keith (keith.patterson@pall.com), Brode, Jim (jm.brode@pall.com)
 Kari Strumauer (kstrumauer@hv.com), rweiss@hv-operations.com, Peters, Sue Peters (sue.peterson@pall.com)
 Amanda Isabelle (amanda.isabelle@pall.com)

Date: 5/03/22 Signed: 

IF YOU DO NOT RECEIVE ALL PAGES OF THIS TRANSMITTAL, PLEASE CALL 734-665-0059.

The material is intended only for the use of the individual or entity to whom it is addressed, and certain information that is privileged and confidential. If you are not the intended recipient of the report or responsible for delivering the material to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone. Thank you.

K001-002-22Date_Transmittal_Cover_Page_18.5a

Entered	USEPA 121A
Q10C Batch Number:	G001-002-22
Doc. No.:	G001-002-22
Entered Date:	5/03/2022
Report Date:	5/03/2022

Matrix Spike (MS) Matrix Spike Duplicate (MSD)	
Entered	14-Dioxane
Matrix	Water
Sample ID	G0420221-1
Sample Date	04/20/2022 13:40
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G001G042021

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-61-1	0.005	0.001		

1,4-Dioxane by GC/MS
Data Summary Sheet

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-61-1	0.005	0.001		

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-61-1	0.00	0.001		

1,4-Dioxane by GC/MS
Data Summary Sheet

Parameter	Instrument	Result	MDL	PQL	Qual
1,4-Dioxane	GC/MS	0.00	0.001		

ATSI

1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	G001-002-22
Client Sample ID	G0420221
Matrix	Water
Sample Date	04/20/2022
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G001G042021

Parameter CAS# Result MDL PQL Qual


 1,4-Dioxane by GC/MS
Data Summary Sheet

ATSI Project Number	G001-002-22
Client Sample ID	G0420221
Matrix	Water
Sample Date	04/20/2022 13:40
Analytical Method (USEPA)	USEPA 1624
Preparation Method (USEPA)	USEPA 1624
QC Batch Number	G001G042021

Parameter CAS# Result MDL PQL Qual

Comments:
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.

ATSI

1,4-Dioxane by GC/MS
Data Summary Sheet

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-61-1	0.005	0.001		

Parameter CAS# Result MDL PQL Qual

Comments:
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.

ATSI

1,4-Dioxane by GC/MS
Data Summary Sheet

Parameter	CAS#	Result	MDL	PQL	Qual
1,4-Dioxane	123-61-1	0.00	0.001		

Parameter CAS# Result MDL PQL Qual

Comments:
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.
 All detection limits (LD) are reporting detection limits.



1,4-Dioxane by GC/MS

Data Summary Sheet

Set Number	G001-002.22	Percent Mixture	100.0
ID Number	04262211	Instrument	2700V
Sample ID	0426221-7	Subsample (mL)	5.000
Matrix	Water	Final Volume (mL)	5.000
Date	04/26/2022 12:49	Dilution Factor	1
Ion Method (USEPA)	USEPA 1024	Basis	Wt/wt
Preparation Method (USEPA)	USEPA 1024	Sample Date	04/26/2022 12:27
QC Batch Number	GCOH042221	Analytical Method (USEPA)	USEPA 1024
		Preparation Date	04/26/2022
		Analysis Date	04/26/2022 15:29:44

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result ND 0.001 MDL 0.001 PQL U Qual U

Comments:
All methods reference 1,4-Dioxane internal reference added.
All methods reference 1,4-Dioxane internal reference added.
All methods reference 1,4-Dioxane internal reference added.
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

ATSL Project Number	G001-002.22	Percent Mixture	100.0
ATSL Job Number	0426221	Instrument	2700V
Client Sample ID	0426221	Subsample (mL)	5.000
Laboratory Sample ID	0426221-8	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	04/26/2022 12:27	Basis	Wt/wt
Analytical Method (USEPA)	USEPA 1024	Sample Date	04/26/2022 12:27
Preparation Method (USEPA)	USEPA 1024	Preparation Date	04/26/2022
QC Batch Number	GCOH042221	Analysis Date	04/26/2022 15:37

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result ND 0.001 MDL 0.001 PQL U Qual U

Comments:
All methods reference 1,4-Dioxane internal reference added.
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

ATSL Project Number	G001-002.22	Percent Mixture	100.0
ATSL Job Number	0426221	Instrument	2700V
Client Sample ID	0426221	Subsample (mL)	5.000
Laboratory Sample ID	0426221-9	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	04/26/2022 12:31	Basis	Wt/wt
Analytical Method (USEPA)	USEPA 1024	Sample Date	04/26/2022 12:31
Preparation Method (USEPA)	USEPA 1024	Preparation Date	04/26/2022
QC Batch Number	GCOH042221	Analysis Date	04/26/2022 16:37:28

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result ND 0.001 MDL 0.001 PQL U Qual U

Comments:
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

ATSL Project Number	G001-002.22	Percent Mixture	100.0
ATSL Job Number	0426221	Instrument	2700V
Client Sample ID	0426221	Subsample (mL)	5.000
Laboratory Sample ID	0426221-10	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	04/26/2022 12:46	Basis	Wt/wt
Analytical Method (USEPA)	USEPA 1024	Sample Date	04/26/2022 12:46
Preparation Method (USEPA)	USEPA 1024	Preparation Date	04/26/2022
QC Batch Number	GCOH042221	Analysis Date	04/26/2022 17:41:23

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result ND 0.001 MDL 0.001 PQL U Qual U

Comments:
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

Set Number	G001-002.22	Percent Mixture	100.0
ID Number	0427221	Instrument	2700V
Sample ID	0427221-1	Subsample (mL)	5.000
Matrix	Water	Final Volume (mL)	5.000
Date	04/27/2022 11:03:40	Dilution Factor	1
Ion Method (USEPA)	USEPA 1024	Basis	Wt/wt
Preparation Method (USEPA)	USEPA 1024	Sample Date	04/27/2022
QC Batch Number	GCOH0427221	Analytical Method (USEPA)	USEPA 1024
		Preparation Date	04/27/2022
		Analysis Date	04/27/2022 11:03:40

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result 0.006 MDL 0.001 PQL U Qual M

Comments:
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

ATSL Project Number	G001-002.22	Percent Mixture	100.0
ATSL Job Number	0427221	Instrument	2700V
Client Sample ID	0427221	Subsample (mL)	5.000
Laboratory Sample ID	0427221-8	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	04/27/2022 11:03:45	Basis	Wt/wt
Analytical Method (USEPA)	USEPA 1024	Sample Date	04/27/2022 11:03:45
Preparation Method (USEPA)	USEPA 1024	Preparation Date	04/27/2022
QC Batch Number	GCOH0427221	Analysis Date	04/27/2022 12:34:35

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result 0.035 MDL 0.01 PQL M Qual M

Comments:
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

ATSL Project Number	G001-002.22	Percent Mixture	100.0
ATSL Job Number	0427221	Instrument	2700V
Client Sample ID	0427221	Subsample (mL)	5.000
Laboratory Sample ID	0427221-9	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	04/27/2022 12:31	Basis	Wt/wt
Analytical Method (USEPA)	USEPA 1024	Sample Date	04/27/2022 12:31
Preparation Method (USEPA)	USEPA 1024	Preparation Date	04/27/2022
QC Batch Number	GCOH0427221	Analysis Date	04/27/2022 15:55:41

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result ND 0.037 MDL 0.001 PQL U Qual M

Comments:
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.



1,4-Dioxane by GC/MS

Data Summary Sheet

ATSL Project Number	G001-002.22	Percent Mixture	100.0
ATSL Job Number	0427221	Instrument	2700V
Client Sample ID	0427221	Subsample (mL)	5.000
Laboratory Sample ID	0427221-7	Final Volume (mL)	5.000
Matrix	Water	Dilution Factor	1
Sample Date	04/27/2022 12:31	Basis	Wt/wt
Analytical Method (USEPA)	USEPA 1024	Sample Date	04/27/2022 12:31
Preparation Method (USEPA)	USEPA 1024	Preparation Date	04/27/2022
QC Batch Number	GCOH0427221	Analysis Date	04/27/2022 16:34:37

CAS# 123-91-1 Result MDL PQL Qual

Parameter 1,4-Dioxane CAS# 123-91-1 Result MDL PQL Qual

Result ND 0.015 MDL 0.004 PQL M Qual M

Comments:
All methods reference 1,4-Dioxane internal reference added.

M = Includes measured reporting limit based upon sample dilution.

